Proceedings of the

1989 Hill and High Country Seminar

New Zealand Mountain Lands Institute, Lincoln University

Proceedings of the 1989

HILL AND HIGH COUNTRY SEMINAR

Lincoln University

July 1989

Editor: B. T. Robertson

Published by the New Zealand Mountain Lands Institute
Lincoln University
Canterbury, New Zealand

December 1989

ISBN 0-908584-02-4

Contents

McCaskill Memorial Lecture

New Horizons

The New Zealand Mountain Lands Institute

Bruce J Ross*

Welcome to this the fifth hill and high country seminar to be held on this campus. This seminar is different from those of earlier years in several respects.

For example this year the seminar is organised by the staff of the New Zealand Mountain Lands Institute, a new Institute which has replaced the TGMLI. This new initiative arose out of recent institutional reforms and a change in funding source which in turn necessitated a change in direction from that pursued by TGMLI. The new Institute, is lean, mean and hungry, with a staff of two people who worked for TGMLI for several years, Chris Kerr and Brian Robertson.

Late last year the Minister for the Environment agreed to fund a work programme for the development of consistent and comprehensive policies for resource use in mountain lands. This day-to-day work will be carried out by the staff of the New Zealand Mountain Lands Institute.

Central to the operation of the Institute will be a Mountain Lands Committee - an independent advisor Ministers and governments on policies for the use of mountain land resources.

The Committee will comprise senior people with an interest

*The Principal, Lincoln University

The Committee will comprise senior people with an interest in and knowledge of New Zealand's mountain lands. In seeking suitable people Council has looked for experience and expertise rather than representatives of any particular user group or groups.

The goals of the Institute and Committee will be:

- to examine and review any aspect of mountain land resources or their use;
- to identify issues and options for the management of mountain land resources;
- to act as a forum for public debate seeking consensus on issues related to the use of mountain resources;
- to advise governments on comprehensive policies for the use of mountain land resources;
- to make information publicly available.

The Institute will operate through:

- the provision of forums such as the Hill and High Country Seminar and other specialist workshops/ seminars/conferences for public debate on issues affecting the use of hill and mountain lands, the preparation of discussion papers outlining the issues, options, and recommendations for initiatives by the committee;
- making public through the journal 'Review' and any other means, information before, and recommendations from, the Committee, and any other information relevant to the use of mountain lands.

The Mountain Lands Committee will, through debate and consultation attempt to:

- resolve conflicts arising from the use of mountain lands;
- facilitate the development of policies for resources use in mountain lands;
- be able to offer independent advice to the minister(s) on the use of mountain lands;
- be able to advise central, regional and local government on comprehensive and consistent policies for the use of mountain lands.

Issues may be brought to the Institute by the Minister for

the Environment and other ministers, government agencies, regional and local authorities and interest groups.

Membership of the Mountain Lands Committee has been decided by Lincoln College Council after consultation with, and on the recommendations of, appropriate organisations.

The Chairperson will be appointed by Lincoln College Council.

The Committee will meet at Lincoln College and be serviced by Lincoln College staff of the Institute.

The Committee will be an independent advisory forum to Ministers and to public agencies and because of its composition will be neutral, providing opportunities for consensus to be reached between interest groups and between departments.

The Committee and Institute will have a special relationship with the Minister for the Environment because its goals fall within the activities of the Ministry. The Ministry for the Environment will be the conduit for funding approved by the Minister for the Environment. The Secretary for the Environment will be accountable for reviewing the expenditure of allocated funds.

A work programme for 1989/90 and a general programme for 1990/91 has been submitted to the Minister for the Environment for approval. Policy issues for examination by the Institute in 1989/90 include the following:

- review of high country policies
- management of semi-arid land
- review of Crown land tenure
- review of policies for soil conservation and weed and pest management
- management of fire in mountain lands

You will note that some of these topics are to be discussed at this seminar. I invite your active participation.

Crown Land Reform

D. Gullen*

A number of people have been involved in the Land Act review process and some of them were invited to present this paper but could not be available because of other pressing commitments.

The Minister of Lands, Mr Tapsell, has indicated that he is not yet in a position to make further announcements on the land bill from what he said at Mt White in March.

I understand the chairman of the officials coordinating committee which had overall responsibility for the land act review at the officials' level, was invited to present this paper. He may have been able to provide an interesting overview on the committee's work from his perspective as a treasury director; I cannot as I was not on the officials committee.

The invitation naturally then passed to the acting Director-general, Mr Ian Campbell who is also unavailable as he retired last Friday, as did his deputy, Mr Tony Phillips, coincidental with the expiry of the Department as at 30 June. Their retirement is a significant loss of expertise to the Review but we are pressing on and expect, failing any last minute hiccups, to be able to provide the Minister with final advice in a matter of days for drafting instructions to issue to parliamentary counsel for the land bill to be prepared. I cannot tell you anything more about the bill's timetable than that.

---

*Department of Lands, Wellington

I mentioned Mr Campbell's retirement. The appointment of Mr John Bishop to the position of acting Director-General was announced last Friday and his deputy is Mr Errol Fogarty. Both were directors with the Department. Mr Bishop will perhaps be known for his work on the earlier land act review that was cancelled in 1985 and which preceded the environmental restructuring.

In respect of the Department some of you will know that the State Owned Enterprises Amendment Bill (No. 6) was introduced in June to extend the life of the Department to 30 June 1990. The Bill has not been passed and cannot be considered by Parliament again until it resumes on 11 July. The legislation will retrospectively sanction the activities of the Department from 1 July onwards.
Technically the Department does not exist but I assure you that we are still in business.

Background to Reform

The review of the Land Act 1948 arises from the environmental restructuring and the creation of the Department of Conservation and State Owned Enterprises. The Review was announced by the former Minister of Lands, the Hon. Koro Wetere in July 1987 when he said:

"Many changes were made to the Act to set up the Department of Conservation and the State-Owned Enterprises. A full review is now needed to remove redundant or outdated powers, so that any powers and functions which remain would fully reflect Government policy."

"The Act is complex and revision will be a major task, but it is our intention to enact the Legislation in 1988. The present Act has been in existence for almost 40 years, and has become steadily less relevant for today's needs."

A draft paper in the format of a Bill was completed by the Department early last year for the consideration of the Officials' Coordinating Committee chaired by Treasury which would later

report to Government on particular policy matters. That Committee comprises representatives from various Government agencies.

On the subject of the Department's paper, on what we now call categorisation, I think it may have been influenced to some extent by the 1982 Clayton Committee of inquiry into Crown leases. The concept of multiple use land is discussed in the committee's report. The Department's paper was prepared under the chairmanship of a former Director-General of Lands, Mr Noel Coad - I need not discuss his credentials.

With the demise of the Ministry of Works and Development on 31 March 1988 responsibility for particular public works act functions, including the compulsory acquisition of land and disposal of surplus government property, transferred to the Department of Lands. It is intended that those and other provisions will be transferred to the Bill having gone through the internal review. That was a further complication in the review process.

Pastoral land is of course subject to the Land Act and there were two specific decisions by Government that determined why and how it should be handled in the context of the Land Act Review.

(1) Because pastoral leasehold land is fragile and sensitive to physical disturbance, has many important environmental values, and also possesses important economic values, notably in farming, tourism and recreation, the Government decided that pastoral leasehold land would not be transferred to any of the new agencies. Rather it would remain Crown land administered by the Department of Lands, with day to day management of the leases being carried out on an agency basis, by Landcorp in consultation with the Department of Conservation on conservation issues.

(2) Government directed that the Land Bill provide for the administration and reclassification of pastoral leasehold land and for the preservation of the natural, recreational and historical values of such land.

Land Bill

A review of the specific announcements in respect of pastoral leasehold land which the Minister of Lands made at Mt White on 29 March, follows.

1. Philosophy

The continuing objective of the Crown's management will be to protect and maintain the value of its asset. The Bill will now take into account the natural, historical, cultural, recreational and commercial values of that asset.

That objective will provide a philosophical basis in the bill for the overall administration of pastoral leasehold land.

2. Management Objectives

In the past the Government's conservation objectives have been guided by the policies of the Land Settlement Board. The Board has been abolished and those objectives will now be more formally set out in the new Land Bill.

3. No New Pastoral Leases

Except for the purpose of restructuring existing leases and licences, there will be no new pastoral leases or licences issued from the time the Land Bill comes into force.

Clearly that supports the concept of categorisation where there is the opportunity to phase out the current pastoral lease tenure to a range of other possibilities.

4. Offence and Penalty Provisions

The new Land Bill will incorporate offence and penalty provisions for infringement of the lease provisions. Until now the only penalty provided has been forfeiture. The new bill will provide for reinstatement of damage at the lessee's expense where that is practical, or a monetary fine may be imposed. The ultimate penalty of forfeiture will of course remain.

The intent of this provision is actually to increase lessees rights. Currently, for non-compliance with any provision, the Crown may only forfeit the lease or do nothing. It is acknowledged that there has never been any forfeiture for non-compliance with leasing provisions but the Department can point to cases in the past where lessees have failed to observe their obligations. It is intended that the Crown will decide when non-compliance has occurred and seek remedy from the lessee who has a right to a rehearing. If that cannot be managed satisfactorily, then there is recourse to the court for remedy. There is no suggestion the Crown can impose fines.

5. Discretionary consents

The new Land Bill will retain the requirement that lessees seek the Crown's consent to carry out activities which involve soil disturbance, burning or otherwise destroying vegetation or planting trees.

There has been unfavourable comment from some lessees about the words "or otherwise destroying vegetation". The response to that is that lessees currently do not have any authority without consent to destroy vegetation so nothing has changed. The inclusion of these words emphasises that point. I am sure the practical realities of farming in the pastoral context will ensure that lessees will have the appropriate consents and of course there will be a good husbandry provision.

6. Block limitations

The Bill will provide for the imposition of Block stock limitations on pastoral leasehold land. That is to say there will be the provision for the imposition of stock limitation on individual sections of the land.

The former Land Settlement Board had a block limitation policy which could only be implemented by negotiation. The purpose of this change is to put into legislation what is an appropriate management mechanism that may be used in particular circumstances. It is not intended to activate it on a wholesale basis.

7. Categorisation station

The new Bill will provide an updating of the Reclassification mechanism. This will now be called Categorisation. There will be three categories: Farmland, Restricted Use Land and Conservation Land. My colleagues will discuss this subject in more detail later, but suffice to say now it was always the intention of the former Land Settlement Board that all pastoral leasehold land would be looked at again in the context of reclassification which we now term categorisation. The difference now is that unless a lessee agrees to the total categorisation proposal, it will not be implemented in part. The details of the process of implementation have yet to be determined and may only be when the Bill is enacted.

8. Non-pastoral activities

The Land Bill will provide for the granting of Special Use Permits for activities not otherwise allowable in pastoral lease land.

Again, and as you would expect, the Crown may impose any appropriate and relative conditions on any special use permit it grants.

If a proposed activity involves significant change in the use of the land, the Crown may allow the land to be taken out of pastoral lease and placed under some other form of tenure rather than grant a special use application.

9. Right of hearing

There is provision for the rehearing process to remain. Some have proposed an arbitration process particularly in respect of some discretionary matters like soil disturbance but the Government has not accepted that proposal.

The Crown is owner of the land and reserves to itself the final right of decision unless of course the lessee is willing to trade some substantial right in return. The Crown has been concerned that the process of arbitration would not provide any reasonable means of discouraging frivolous applications and unnecessary costs.

The Crown, therefore, will continue to reserve to itself the final decision-making authority and, therefore, arbitration is unacceptable. Lessees will continue to have the right to a rehearing, representations to Ministers and the Ombudsman, court appeal of decisions and judicial review.

10. Public participation

Recognising the widespread call for greater public input into the management of public land, the new bill will incorporate a process of public consultation similar to the Conservation Act. But there will be provision for both oral and written submissions which will be able to be invoked:

- When developing policies for the management of pastoral leases.
- When assessing special use permit applications.
- During the categorisation process (but not during the subsequent negotiation between the Crown and the Lessee).

The new Bill will retain the right of rehearing for parties directly affected by a decision of the Crown in respect of a pastoral lease.

11. Maori Land Rights

In keeping with the growing recognition of Maori Land Rights and the Crown's undertakings under the Treaty of Waitangi the Bill will specifically provide for consultation with the Maori people at the time categorisation of pastoral leasehold land is begun.

Conclusion

Since the Minister of Lands' announcement in March there has been some consultation with interest groups to the extent of clarifying the intent of particular provisions and how they affect existing lessee rights. Some people have suggested that any changes to the existing pastoral lease contract should be by negotiation on an individual basis and do not support some of the proposed changes. It is, therefore, appropriate to put the changes in perspective against existing provisions.

It is intended that the principle of 'exclusive use of

pasturage' will continue to be provided by specific provision in the Land Bill. Under existing legislation matters requiring consent have never been 'by negotiation only.' The final decision has always been with the lessor (Crown). The existing legislative provisions are not limited to soil and water considerations although historically they have been the major factor in considering any application.

In general, it is accepted that during the investigation of applications some negotiations do occur. That is a practical reality common to administrative law, but it is incorrect to suggest that under the current legislative provisions the wide conservation objectives may only be achieved solely by negotiation.

Soil disturbances, burning, recreation permits, tree planting, etc. in terms of existing legislative provision may currently be considered in terms of these wider considerations the Land Settlement Board was addressing. There is currently under section 167(3) of the Land Act 1948 authority to reserve land for scenic, scientific, recreation purposes, etc. without any recourse to negotiations. This provision has never been promoted as an appropriate mechanism to deal with conservation issues nor will it be. The preference is to negotiate with lessees.

The point is that, what have been perceived to be negotiations only, have been final decision making processes covering the widest possible conservation scenario. That is not being changed but being put into a more up-to-date and appropriate process where lessees will hopefully have certainty and full redress in respect of decisions. The onus will be on the Crown to consider particular conservation objectives against farming objectives which is what consent applications are generally about. The Crown will have to be very specific about its reasons for a decline decision and it will no longer be able to rely on the wide general power of discretion that is available to it now. The perspective is that the

lessee rather than the Crown knows best about the farming considerations and the Crown need not see itself as having a consultancy role in that.

In the past that situation became fudged sometimes. The Crown of course must continue to have particular regard to its own commercial interest in the land.

In respect of the Land Bill itself, development policy statements and implementation processes follow on from the enactment of the Bill.

When the Bill is introduced there will be opportunity for public submissions through the Select Committee process.

Legal Rights of Pastoral Lessees

J C Corry*

Legislation - Definitions

In the Land Act 1948 there are the following definitions:

"Lease" means a lease granted under this Act, or any former Land Act; and "Lessee" has a corresponding meaning.

"Licence" means a licence granted under this Act or under any former Land Act; and "licensee" has a corresponding meaning.

(The following definitions were not inserted in the Act until 1979, see section 5(1) Land Amendment Act 1979).

"Pastoral Land" means Crown land that is for the time being so classified by the Board under section 51 of this Act;

"Pastoral Lease" means a lease of pastoral land granted under section 66 of this Act;

"Pastoral Occupation Licence" means a licence to occupy pastoral land, granted under section 66AA of this Act.

The Land Act 1948 gives pastoral lessees certain defined and express rights including:

- the exclusive right of pasturage (s.66(2))
- a perpetual right of renewal for terms of 33 years (s.66(2))

The Act itself does not expressly give any other rights in relation to the occupation or possession of the land held by a pastoral lessee; the question which arises is what other rights, apart from those

*Solicitor, Wellington

expressly given by section 66, do pastoral lessees have.

Lease or Licence

An immediate question is whether a pastoral lease is indeed a lease or whether it is merely a form of licence. The legal difference between a lease and a licence is very critical; a licence is a mere privilege to enter upon the land of another for the purpose of the licence. On the other hand a lease is more than a mere privilege; a lease creates an estate and interest in the land itself and carries with it certain of the rights of an owner of the land - e.g. to exclude trespasses, to permit others to use the land (as sub-lessees or perhaps as licensees or visitors). On the other hand a licensee who is allowed to go onto land for some purpose, for example to use the telephone, has no right to permit anyone else to come onto the land or to do anything on the land, for example, to pick flowers or to put up fences or to make a cup of tea.

In considering the nature of a lease compared with a licence you should bear in mind that in our law, land is looked at as having a time dimension. The owner of freehold land is regarded legally as the owner of the land for the rest of time. A lessee (that is to say a true lessee) is in effect the owner for a chunk of the time during which the land exists. Sometimes courts or conveyancers speak of a lease being "carved out" of the freehold interest in the land. In effect the lessee is the owner of the land during the chunk of time during which the lease runs. At the end of that chunk of time the land reverts to the freehold owner. While the lease exists (that is to say during its term) the lessee has exclusive rights in respect of the land (subject only to the terms of the lease itself) and these rights are enforceable against the freehold owner.

Among those rights is the lessee's right of exclusive occupation or exclusive possession as against the landlord and any other person. If the transaction does not give the "lessee" this exclusive

possession it is not a lease but a licence.

Merely to call the transaction a "lease" is not enough to make it a lease as opposed to a licence. In a recent case in England (Street v Mountford (1985) 2 all England 289) one of the Judges said:-

> "The manufacture of a five-pronged implement for manual digging results in a fork, even if the manufacturer ... insists that he has made and intended to make a spade."

You will hear in a paper shortly in this Seminar a similar comment about cats and dogs. This was said in order to hammer home the point that it does not matter what the arrangement is called - lease or licence - what matters is the true nature of the arrangement. If the arrangement so created is actually a licence and not a lease, then calling it a lease does not make a licence a lease.

What is a lease as opposed to a licence?

The following four characteristics if present generally (but not inevitably) create a lease:-

(i) a legal right,
(ii) to exclusive possession of the land,
(iii) for a defined term,
(iv) for a consideration - (usually rent) (although this is not always essential).

Even if these characteristics are all present the occupier may still be a licensee - depending in part on the intentions of the parties involved. This frequently happens when premises are let as accommodation for a live-in building caretaker or a farm worker living in a cottage.

I want to focus on the question of exclusive possession. Does the Land Act 1948 give a pastoral lessee exclusive possession of the land, or does the pastoral lessee have some lesser right of occupation?

The original section 66(1)-(5) Land Act 1948 read as follows:

1) A pastoral lease or pastoral occupation licence under this Act shall entitle the holder thereof to the exclusive right of pasturage over the land comprised in this lease or licence, but shall give him no right to the soil.

2) Every pastoral lease or pastoral occupation licence may be subject to such restrictions as to the numbers of stock which may be carried on the land comprised therein as the Board in each case determines.

3) A pastoral lease under this Act shall be a lease for a term of thirty-three years with a perpetual right of renewal for the same term, but with no right of acquiring the fee-simple.

4) The yearly rent payable for the first term of a pastoral lease shall be determined by the Board.

The rent for every renewal of a pastoral lease shall be determined in the manner set out in Part VIII of this Act for the renewal leases, and all the provisions of that Part shall, with the necessary modifications, apply, save that, instead of determining the rental value of the land for the purposes of the renewal pastoral lease, a fair annual rent shall be fixed.

5) A pastoral occupation licence shall be for such term, not exceeding twenty-one years, and at such annual rent, as the Board in each case determines.

It will be seen that both a pastoral lease and a pastoral occupation licence entitled the holder to exactly the same thing, namely: "the exclusive right of pasturage over the land comprised in the lease or licence but shall give him no right to the soil.

The rights of a pastoral lessee are now set out in section 66(2) and those of a pastoral licence in section 66AA(2). Except for the use in the former of the words "pastoral lease" and the latter "pastoral occupation licence" these two subsections are identical and are identical with the original section 66(1).

Can any right of exclusive occupation be spelt out of the rest of the original section 66? There is certainly nothing in the rest of the original section 66 which expressly confers a right of exclusive occupation. The same can be said of both the present section 66(2) and for that matter section 66AA(2). It is easy to understand that a pastoral occupation licensee has been given an exclusive right of pasturage but it does seem odd that if a pastoral lessee as such already has right of exclusive occupation, the Act goes on to provide for the exclusive right of pasturage as well. The exclusive right of pasturage is plainly a lesser right than a lessee's full right of exclusive occupation, and it would seem absurd to grant in addition to exclusive occupation a further exclusive right of pasturage which is included within the former. This suggests to me that a pastoral lessee does not have a right of exclusive occupation at all, but merely an exclusive right of pasturage. After all this is what the Act says.

Further, the pastoral lessee has "no right of the soil" - let alone any exclusive rights in respect of the soil. It is indeed difficult to see what a pastoral lessee is entitled to apart from the exclusive right of pasturage.

In the case of Commissioner of Crown Lands v Bennie (1909) 28 NZLR 955, the Court of Appeal said of leases under two sections of the Land Act 1892 - section 176 (small grazing runs) and 198 (pasturage leases) that "in each of these cases the lease of the surface of the land gives strictly limited rights to the surface, and in the case of a pasturage lease gives a right to the vesture only". (p.960) Vesture means the vegetation on the surface of the land.

Under section 176 Land Act 1892 a lessee was entitled to the exclusive right of pasturage over the land in the lease and to all crops; under section 198 the lease entitled the holder to the exclusive right of pasturage over the land specified in the lease but gave no right to the soil, timber or minerals.

In that case the Court did not have to determine the precise nature of a pasturage lease under section 198 (which corresponds to the present section 66) but the judicial reference to the strictly limited rights to the surface suggests to me that the lessee does not and did not enjoy exclusive possession of the surface.

Another indicator is found in section 176 Land Act 1948 (relating to trespass on or damage to Crown land). "Lands of the Crown" is defined as:-

"(a) Crown land and any other lands administered by the Board under this Act which respectively are not for the time being subject to any lease, licence, or demise serving to vest the exclusive occupation thereof in any person other than the Crown:

(b) Any public reserve not granted to or vested in any local body, trustees, or other persons."

This definition appears to accept the possibility of a "lease" or "demise" (the technical term for the grant of a lease) which does not serve to vest exclusive occupation in someone other than the Crown. The concept of a lease in which the lessee does not have exclusive occupation of course is foreign to our law. e.g. Street v Mountford.

I simply repeat again there is no such thing as a lease which does not vest exclusive occupation in the lessee. However the definition in section 176 appears to contemplate the possibility and suggests to me that the word "lease" in this Statute is not being used in its correct technical sense certainly not in section 176(a) nor for that matter in section 66 or where it is used in the section 2 in the definition of pastoral lease. I would also question whether the expression "lease" as defined in the Land Act 1948 refers to a lease in the strict sense or whether it has some loose or looser meaning.

However some weight must be given to Parliament's use of the word "lease" to describe the transaction. I have noted,

however, that in earlier legislation in 1924, especially in Part VI in which pastoral runs are described both as a license (section 249) and as a lease (sidenote to section 250), there has obviously been some confusion about the two different concepts. I note also in that Act that in Part V a small grazing run was to be held under a lease which entitled the lessee to the exclusive right of pasturage and to all crops taken off any part of the land.

I would not place any great weight on the use of the word "lease" in Section 66 to justify the contention that the Parliamentary draughtsman intended to give a pastoral lessee a right of exclusive occupation as against the Crown or indeed anyone else. The significant restrictions on the lessee's rights tend to negate the suggestion that a pastoral lessee has any exclusive right of occupation.

I would not for myself place any weight on the use of the word "lease" by the law draughtsman.

In my opinion a pastoral lease under section 66 Land Act 1948 is not a lease at all because the "lessee" has no right of exclusive possession of the land; all that a pastoral lessee has are "strictly limited rights to the surface" and among those rights is the exclusive right of pasturage.

However some pastoral lessees may find that although the leases have purportedly been issued under Section 66 Land Act 1948 the documents that have actually been executed may have given them a lease in the full sense. Subject to any question of leases having been granted *ultra vires* Section 66, any lessee who is disturbed about his position may care to peruse the document for the purpose of seeing precisely what the lease itself expressly grants.

The pastoral lease document in other words may provide an exclusive right of occupation which the legislation has not given. Those lessees will be in a stronger position to argue that they have leases rather than licences of their land.

Legal Rights of Pastoral Lessees

J L Joseph*

Mr Corry in his paper has taken the view that a pastoral lease does not confer upon the lessee a legal right of exclusive occupation and is accordingly no more than a licence. I have taken a contrary view.

Mr Corry has outlined the distinction between a lease and licence and I need not traverse that ground except to say that the distinction is indeed critical. The occupier, if he is a lessee, will enjoy certain legal rights which a licensee will not. Perhaps the most important of those rights for the holder of a pastoral lease is his right to sue others, including his landlord, for trespass and nuisance but in broader terms his rights as a lessee will place him in better stead *vis a vis* various other competing interests.

It is clear that to call a transaction a lease or a licence is not necessarily to make it the same in law. That was the basis of the 1985 House of Lords decision in Street v Mountford. In that case the Court upheld the existence of a tenancy (or a lease) notwithstanding that the agreement between the parties contained the statement "I understand and accept that a licence in the above form does not and is not intended to give me a tenancy .....".

However the fact that the parties may elect to call the transaction a lease or a licence is not irrelevant. In the 1988 English Court of Appeal case of Antoniades v Villiers, Bingham L.J., referring to Street v Mountford, said:

---

*Solicitor, Christchurch

"The House of Lords has not, I think, held that assertions in a document that it is a licence should be ignored. It has held the true legal nature of a transaction is not to be altered by the description the parties choose to give it. A cat does not become a dog because the parties have agreed to call it a dog. But in deciding whether an animal is a cat or a dog the parties' agreement that it is a dog may not be entirely irrelevant."

My first point is therefore that Parliament itself, in enacting s66 of the Land Act, elected to call a pastoral lease a lease and this cannot be ignored.

Furthermore, in enacting s66 AA, it drew a distinction in separating the terms and conditions of pastoral leases and pastoral occupation licences.

I reiterate the characteristics, as set out in Street v Mountford, which will generally give rise to the creation of a lease. They are:

i. A legal right to exclusive possession of the land.
ii. For a defined term.
iii. For a consideration.

The pastoral lease is certainly for a term and certainly for a consideration, i.e. a rent and accordingly these tests are not an issue.

I would now like to look specifically at the remaining characteristic, namely that of the right to exclusive occupation. The question arises as to whether the Crown, in granting a pastoral lease, also confers upon the lessee a legal right of exclusive occupation of the property.

The Land Act does not expressly provide such a right. What expressly then is conferred in the pastoral lessee? On the face of it he has a right of exclusive pasturage and a perpetual right of renewal, so how can we infer that he also has a right of exclusive occupation?

To make this inference we must look at the overall circumstances of the pastoral

lessee. Those circumstances extend not only to his rights but also to his obligations. I believe that when those rights and obligations are considered they are wholly consistent with the intention that in making a grant of a pastoral lease the Crown in fact and in law confers upon the holder a right of exclusive occupation.

Let us look briefly at the points involved:

1. The pastoral lessee is under an obligation to farm the land diligently and in a husbandlike manner according to the rules of good husbandry, and not to in any way commit waste. To farm in such a manner must surely be consistent with the requirement of exclusive occupation. There would certainly be few farmers who would say otherwise.

2. The pastoral lessee enjoys the right of exclusive pasturage. It matters not whether pasturage exists at any one point of time. The right is the important factor and I take such right as being consistent with the right to exclusive occupation.

3. The pastoral lessee has a right to compensation for his improvements, that is his own pasture, his trucks, his fencing and the like. Any interference whatsoever with these improvements would be inconsistent with his right to compensation. Interference itself, and not its degree, is the critical test and the rights of others to occupation must be definition, have the potential for interference, and hence the potential for a diminishing of the right to compensation.

4. The general requirement that the lessee personally reside on the property is, on balance, more consistent with the right to exclusive occupation of the property as a whole than otherwise. If the right to exclusive occupation of the property was not intended, then surely there would have been a saving provision with regard to the lessee's own residence.

5. With respect I do not attach any importance to the fact that the pastoral lessee has no right to the soil. That exclusion is quite consistent

with the lease of farm land where not only rights to soil, but also similar rights to gravel, timber and the like are excluded. Taking the analogy a step further, the Crown's reservation of minerals in respect of land in New Zealand in no way derogates from the legal status of the fee simple or freehold title.

6. The lessee's express responsibilities to not only maintain Crown improvements, but to insure buildings belonging to the Crown, must once again be consistent with his right to exclusive occupation. In some instances it is conceivable that an insurer may not insure where the right to (as well as the fact of) exclusive occupation is not assumed by the lessee.

7. S26 of the Land Act reserves a right of access to the Director-General of Lands and his officers for the purpose of inspecting the property.

The question therefore arises "Why would this provision be necessary if the lessee did not have the right of exclusive occupation?" Was it mere verbosity on the part of Parliament? I don't think so. I think it is yet another factor consistent with the pastoral lessee's right to exclusive occupation of his property.

In all the circumstances I think that the right of exclusive occupation is clearly inferred. In case the inference is still not quite clear to some I refer you to S68A of the Land Act. This section provides for the granting of grazing permits. Subsection 3 is of considerable interest: It provides that "a grazing permit shall not confer on the holder

- The exclusive right to occupy the land to which the permit relates.
- The status of occupier of the land for the purposes of the law relating to trespass.

This leads to one inescapable conclusion, namely that Parliament in enacting s66 intended to confer upon pastoral lessees the right of exclusive occupation. Otherwise why would an exclusion, similar to that

contained in s68 (a), not have been provided?

I therefore have no difficulty in concluding:

1. That Parliament clearly intended a pastoral lessee should enjoy the rights of a lessee and not those of a licensee.

2. That a pastoral lease exhibits all the characteristics of a true lease.

3. That a pastoral lessee has a right to sue in trespass and nuisance (and as well to exercise all other remedies available to a lessee).

4. That there must be a very real prospect that a pastoral occupation licence, within the meaning of s66 AA, is not in law a licence, but a lease.

Legal Rights of Pastoral Lessees

A Commentary

*J Bamford

Over a long period of time recreational hunters have taken part in many debates on the legal rights of pastoral lessees. The obvious reason for this interest is to determine what rights the hunter has to enter Crown lands to hunt Crown-owned wild animals and what rights the pastoral lessee has in regard to the granting or denying of access to these wild animals.

During the perusal of various leases, we became aware that for a few dollars a year, a number of Pastoral Occupational licences, with a nil stocking limit, had been granted to some runholders for large areas of back country. We are in total opposition to that type of exclusivity which has resulted from this policy. More recently, we became alarmed when the acting Director-General of Lands overturned Section 14 of the Land Settlement Board hill country policy which dealt with de-stocking and surrender of land unsuitable for grazing. We are concerned at the wide implications of this action.

My Association, through our solicitor, approached Mr Corry for an opinion and you have heard the outcome of this effort. We welcome his conclusions that clearly show there is no authority within the Land Act giving exclusive occupation. Therefore, if you are neither the owner, nor the exclusive occupier of a pastoral lease, you do not

---

*New Zealand Deerstalkers' Assn, Balclutha

have the right to deny access. S.176 of the Land Act provides that it is an offence to trespass on lands of the Crown and goes on to define Crown Land and lands for the time being, subject to any lease or licence or demise, serving to vest the exclusive occupier thereof in any person other than the Crown.

We do not contend however that there is an automatic right of access over Crown land, as it is an offence to trespass on 'Lands of the Crown' as defined in section 176(1)(a) of the Land Act. However, since a trespass is essentially an entry on to lease land without permission, an authorised agent of the Crown can give permission to specified members of the public to use the Crown land for the purpose of access. In addition a recreational permit granted under Section 66A, does not give any right of exclusive occupation to the permit holder, and accordingly the permit holder cannot deny access to the land over which the permit is granted.

There is very little that Mr Corry could find which supports the claim that a lease exists for pastoral land. Lessees hold no interest in the land, no rights are held to authorize others to use that land, no rights are held to allow anyone to take anything and there is no ability for a lease to be registered under the Land Transfer Act. Section 66 of the Land Act shows that there is no difference between the express rights of the holder of a pastoral lease or a pastoral license. Both have no right to the soil and no exclusive occupation. Therefore what is given is not a lease giving the leaseholder total rights over the land, but merely a licence giving the right of pasturage. The correct legal name for this is a "*profit a pendre*". It is clear in law that a lease can be given over *profits a pendre.* It is also clear that this can be done by statute. It is true that the lessee of a *profit a pendre* does have rights under the Trespass Act, but they are only rights against trespass of the right which the holder of a *profit a pendre* leases.

We see Mr Corry's opinion as being a common sense approach, for, whatever you think of the English language, the Act is no more or less than what you read. Pastoral lessees have the right to pasturage, not to soil and water, they are subject to stock limitations, grazing permits, fire permits, development approval etc. All these rights are at the discretion of the Crown.

Pastoral lessees call for more respect for the status of their leases from interest groups. That is fair enough. But they should not have the right to own public wildlife by refusing access to it. I concede that there are perhaps only a few who deny access completely. I argue against and condemn the practice of selling hunting and access rights to wildlife lessees do not own, on lands which belong to the Crown. John Joseph expresses an opinion on the case presented by Chris Corry, an opinion based on rather weak argument. It centres upon the question of the legal right of exclusive possession of the land by a pastoral lessee acknowledges that "the Land Act 1948 does not expressly provide for such a right" but argues that obligations of lessees rather than specific rights imply the right of exclusive occupation.

Surely most obligations, such as good husbandry provisions and stock limitations are obligations required by the Crown, to protect the Crown Estate.

The concluding argument "that Parliament clearly intended that a pastoral lessee should enjoy the right of a lessee and not those of a licensee" is pure supposition. The vital point is not what Parliament intended to do, but what it did write into law, and the effect of that law, and that is - a pastoral lessee has no right to the soil but an exclusive right to the pasturage.

The Land Bill

This very significant piece of legislation must be of interest to all who utilise the Southern Alps, be that for farming or recreation. The demand by the public for sound

conservation practices, the availability of public lands for recreation and government re-structuring, are all responsible for this review. The most significant change we see will be the placing into legislation of a formula for the categorising of pastoral land in three classes which will eventually lead to land with no commercial farming value being surrendered from the lease and low lands (i.e. farmland) being freehold. There is provision to make access an objective for the management of land held in P.L. and P.O.L. and this objective will be written into the Act rather than access simply being a changeable Department policy. It is noted however that access seems only to be considered, in regard to pastoral leases and licences and there may be other categories of land which may need to be considered. Pastoral leases will disappear in time also. The term "right of pasturage" contained in the 1948 Act still appears. This surely needs to be defined. We note that new conditions will be included in renewals of existing P.L. relating to protection of soil and vegetation. Protection of access should also be included here.

Legal Rights of Pastoral Lessees

A Commentary

H.R. Ensor*

My brief for this seminar is to provide comment on the two previous papers regarding the legal rights of pastoral lessees. In doing this I hope to make clear how I see these rights, as a mere layman and lessee. I will also cover how I perceive the proposed new Land Act provisions affecting these rights as well as what my organisation, the High Country Committee, is saying to the Government regarding these issues.

I would like to start by saying no matter how large, small, or comprehensive a document dealing with land is, it will always raise emotions, sensitivities and differing interpretations.

As an example look at the Treaty of Waitangi, one page - the Land Act, a whole two hundred page document.

I note that the previous two papers both give differing views on the definition of a pastoral lessee's rights. While I agree absolutely with Mr Joseph, I also agree with Mr Corry that lessees do not have exclusive possession of the land. But I would also argue that no one in NZ has exclusive possession of any title of land. There are a multitude of factors that prevent that from occurring. The argument that Pastoral Leases are only licences is interesting but rather academic. Mr Corry states that proof of Pastoral Leases

---

*High Country Committee, Federated Farmers

being only licences is that they cannot be registered under the Land Transfer Act because of Section 82-4 of the Land Act. As I understand it, the Land Transfer Office holds a separate Register of these leases, because of survey standards, rather than because of it being considered a lesser tenure.

The Land Act's definition of a lease - "means a lease granted under this Act". In other words, if it says a lease it means a lease, not a licence. I believe there is more argument in favour of a Pastoral Occupation Licence being called a lease than there is of a Pastoral Lease being termed a Licence.

If a licence doesn't give exclusive possession, and thus occupancy, I feel sorry for those who have a Deferred Payment Licence.

These have generally been considered the second most secure form of tenure after freehold, and presumably registered under the Land Transfer Act, but are still only a Licence.

Another interesting aspect of the Land Act is the clause "no rights to soil". Under the Act's definition of the word "Improvements", which the lessee owns, it includes "in any way improving the character of fertility of the soil". To me this means while the lessees have no rights to the soil, they certainly have a substantial interest in it.

The key issue regarding the rights of Pastoral Lessees is what is really meant, in practical terms as well as in legal terms, by the clause "Exclusive right of pasturage over the land comprised in the lease".

The question Mr Corry raises of whether a lessee is allowed to grant access to other persons onto a lease to work, or simply for enjoyment, is interesting but rather trivial. Quite clearly a lessee must obtain the Crown's consent to allow any other person to carry out any other commercial activity.

Some may argue that exclusive rights to pasture only means that no other person except the lease holder can graze stock on that land. Some will also claim that if the lessee doesn't have specified occupancy rights then he or she cannot prevent another person from entering the land.

In practice, however, exclusive rights to pasture does mean far more. To me the exclusive right of pasturage means that effectively I also have exclusive occupancy whether that is stated in the Act or not. This is because my lease area is defined and allows me to graze what stock, where and when I like within my overall stocking limitation.

The moment anyone else sets foot on a lease they are, or have the potential to, prevent the lessee from exercising his rights to the exclusive use of the pasture. Thus, in my view, exclusive rights to pasture and sole occupancy are inextricably linked. There can be no half way.

The Land Act has another interesting clause under Grazing Permits, which are generally considered the least secure form of tenure; Sec 68A (3) "A grazing permit shall NOT confer on the holder the exclusive right to occupy the land to which the permit relates nor the status of occupier of the land for the purpose of the law relating to trespass".

Nowhere else in the Act can I find reference to a Lease or License having this clause attached. The legislators have chosen to place this clause only on the least secure form of tenure. This indicates that all other tenure is considered to have exclusive occupancy otherwise they would have said so. This adds weight to my belief that the Act, by implication, confers occupancy rights inherently with exclusive rights to pasture.

The HCC believes the argument goes far further, especially into the area of nature conservation. The new proposal of placing nature conservation policy objectives into legislation is effectively removing the "exclusive use rights to the pasture" the

lessee has had. The lessee's use of the pasture is no longer exclusive as it may also be required for other purposes such as nature conservation.

A lessee's right of exclusive use of the pasture is further supported by the lessee's obligations under S.99 (a) to "Farm the land diligently and in a husbandlike manner according to the rules of good husbandry, and will not in any way commit waste."

The Government's present trend of forcing nature conservation onto lessees by legislation is a huge mistake. In an attempt to in some way nail runholders to the wall these policies will make, and in fact already are making, lessees see nature conservation as a liability rather than an asset worthy of their special consideration. This is so sad when you consider the enormous potential there exists in the high country to integrate nature conservation and production.

This is a classic case of politics interfering with practical land management. The proposals may be designed to win votes because of the great misconception that the State can manage the mountain resources better than the combination of the State and private individuals together.

The HCC has made it quite clear to the Minister of Lands that change to a contract is change, no matter how large or small the Government may perceive these changes to be. As Pastoral Leases are a contract, change without agreement that will undermine lessees security of tenure is simply unacceptable.

In spite of the HCC having policies that "support the PNA surveys" and "encourage lessees to allow the maximum public access possible", we are extremely disappointed that lessees should be treated in this manner. Especially after the Minister has stated that existing conservation values are to the credit of the lessees, and, we would argue, to the credit of the 1948 Land Act that offered security of tenure as well as land protection.

As I started with the Treaty of Waitangi it is appropriate to finish with it. The Government has constantly implied that the Treaty is a contract between the Crown and its people and it must be upheld. I would respectfully suggest that Pastoral Leases are also a contract between the Crown and its people and must be upheld.

If the Crown welches on its side of the deal I hope the Government doesn't expect the lessees to just sit there and take it - because they probably won't. I accept there will be no winners but the biggest loser will be nature conservation.

Categorisation of Pastoral Land

K M Stewart*

The Government when deciding on the interim future of pastoral leases required that the Land Act 1948 should be reviewed and "should provide for the administration and reclassification of pastoral leasehold land and for the preservation of the natural recreational and historical values of such land."

Government also charged the Department of Conservation, in consultation with lessees where appropriate, to begin as soon as possible the identification and protection process relating to pastoral leases.

It is with these clear mandates in mind that the Department of Lands started putting pen to paper to produce something that would achieve Government's objectives.

A number of important factors were also taken into account:

1. It was known that there are areas of land within pastoral leases that do not require the restrictions of a pastoral lease nor the requirement for Crown ownership.

2. It was known that there were areas of land unsuitable for grazing and with significant conservation values that were included in leases.

3. It was recognised that there were also areas where a combination of pastoral and conservation values co-existed

*Department of Lands, Dunedin

and where these could not easily be separated out.

4. We were aware of the fact that approximately 2.5 million hectares of land owned by the Crown with a variety of values was tied up through long term leases but the return to the Crown in both commercial or social terms was small and the cost of administration high.

The present Land Act does not allow for land classified pastoral to be freehold. It does provide, however, for the Director General to reclassify land under Section 51(3) and the former LSB had adopted a policy to deal with this.

It is important to note this policy, as it is not too different from the proposals now being promoted in the Land Bill.

The Board, as you will recall, had members representing many interest groups and I believe the policy was generally well accepted. It was developed at a time when there was a growing awareness of conservation issues and a desire on the part of some lessees to freehold their leases.

It is perhaps unfortunate that the policy was put on hold because of lack of resources within the former Lands and Survey Department and its subsequent demise. It is interesting to note however that a handful of formal applications were made to Lands and Survey and in some cases the applicants were keen for the process to be gone through.

The LSBs published policy in regard to reclassification is as follows:

"7.5 Pastoral land will be reclassified as farm land where there is no reasonable doubt as to its suitability for this purpose. Pastoral land will not be reclassified to farm land where in the opinion of the board such land:
(a) is of a tender and erodible nature requiring safe-guards of strict stock limitations or is fragmented within a pastoral lease and boundaries are difficult to define;

(b) contains habitat of indigenous flora and fauna or identified natural values so significant as to require protection;
(c) adjoins or encompasses significant wetlands, lakes and rivers and is necessary to be retained in Crown ownership to assist in the protection of or public access to these features;
(d) has significant existing or potential recreational values which justify retention in Crown ownership;
or
(e) has other specific values including for example exotic wildlife habitat or outstanding historic or landscape features of such significance that the land should be retained in Crown ownership.

7.6 The board recognises that there are means available other than retention of land in Crown ownership which would ensure conservation and protection of natural values or recreational use. Such means include conservation covenants, protected private land agreements and walkway easements/agreements. Where identified natural, historic or recreational values on land suitable for reclassification can be protected effectively by means other than retention in Crown ownership, reclassification approvals will be subject to appropriate covenants, easements or agreements being entered into to protect the identified values.

7.7 After the board has determined the amount of land suitable for reclassification and what land within the total lease with natural or recreational values should be retained in Crown ownership, approval will be given to the reclassification of part of the land in the lease subject to such other conditions as are appropriate to a given situation to provide for public access over, and protection of environmentally sensitive areas on the reclassified land. On receipt of advice of the board's approval to reclassification of part of the land in a lease and any conditions associated with that approval, the lessee may elect to apply for a renewable lease for the reclassified portion or elect not to pursue

his original application any further in which case the land shall remain in pastoral lease.

In addition Section 67(2) Land Act 1948 provided for the board to alienate land on a leasehold basis for terms of up to 33 years with or without a right of renewal, on such terms and conditions as the board determines but with no right of freehold. These were known as management agreements.

That then was the LSB policy on reclassification.

Categorisation - Land Bill

It is necessary to distinguish between the categorisation process and subsequent tenure charges that may result. I intend to comment mainly on the categorisation issue but by necessity some comments also touch on the tenure question. It is the intention that all land held under a pastoral lease will not be able to be freeholded or otherwise removed from a pastoral lease until it has been placed into one of three categories. Either the lessee or lessor can initiate the categorisation process. It is important to note however that categorisation itself does not affect tenure; it does enable subsequent negotiations to take place between the Crown and lessee to develop a package to meet both parties' objectives.

The categories are:

Farm Land

Lands suitable or adaptable for commercial productive use and where the public interest in the protection of natural historical and recreational features may be protected by general laws governing land use or by specific covenants, agreements or easements.

Restricted Use Land

Land having natural recreational or historical features of such significance as to require their retention in public ownership, but on which restricted productive or other commercial uses on appropriate terms and conditions are compatible

with the protection of those features.

Conservation Land

Land with no commercial farming values or land which should be retired from productive use in order to protect it from erosion or to protect predominantly natural, recreational or historical features.

Perhaps the most contentious aspects of the categorisation exercise are:

1. The Restricted Use Land,

2. The matter of charging a commercial rental for land categorised 'farm'.

It is not possible, in every case to clearly divide land in pastoral leases into either conservation or farm land. There are many areas where the two values/uses cannot be separated but by subsequent negotiation satisfactory arrangements could be entered into, similar to the management agreements referred to in the LSB policy which could produce a tenure which would meet both the lessor's and lessee's requirements.

The rental question is of concern to lessees. Presently lessees pay 1.5% of the LEI over the total property and the suggestion in future is that land categorised as farm land and suitable for disposal will at the next 11 yearly rental review attract a more commercial rental - present suggestion is 4% (net).

In exchange the lessees will have an opportunity at any time to freehold this farm land, subject to agreement being reached over the tenures for the balance of the land, and the restrictions of a pastoral lease will be removed on the farm category enabling a lessee to get on and farm the property.

Who will undertake the categorisation exercise and make decisions on categorisation?

I see the exercise being driven by the Crown department responsible for pastoral leasehold land. The initiative for categorisation can of course come from either the lessor or lessee. I believe

however that the lessor's priorities will be established in consultation with the Department of Conservation and would possibly follow closely the priorities already set by that department for its protected natural area programme.

The assessment of farming values would need to be made by an organisation competent in that field. There are many possibilities but quite frankly this is a matter of detail that has not been addressed as far as I am aware.

The question of who would make the decision on the categories is a further matter of detail that has not been resolved but that decision must be reserved to the Crown as owner of the land. Whether that decision made is at a ministerial, executive or committee level has not been decided.

Future Tenures

Negotiations for subsequent changes to tenure has been given initial consideration. It seems appropriate that this will be undertaken by the agency responsible for pastoral leases. The intention is that the Bill remain flexible in the area of tenures so that individual situations can be negotiated to achieve both parties' objectives. The Department is aware that proposals will have to be attractive to encourage lessees to move away from their present leases. This is obviously a matter to be considered further in some detail.

Summary

I have heard it argued on a number of occasions that there seems to be a lot of matters that have not been addressed. That is correct and follows the normal process of legislation, then policy, and implementation procedures, for that policy.

The categorisation process is there to provide a mechanism in legislation to facilitate change which will enable both parties to a lease to initiate moves to remove unnecessary constraints and negotiate more appropriate tenures.

Present legislation does not provide for this and while various reclassification and pastoral reclassification policies have been adopted over the years the rights of the lessor and lessee have not been enshrined in legislation.

Categorisation of Pastoral Land

J. S. Holloway*

The Department of Conservation's mandate for involvement in Pastoral Land has two principal foundations; the long title to the Conservation Act 1986, which requires the Department "to promote the conservation of New Zealand's natural and historic resources", and the mandate given to the Department by Cabinet for the discharge of "non-farming" aspects of the Crown's responsibilities for Pastoral Land under the Land Act 1948.

The Public Interest in Pastoral Land

Pastoral land is clearly land in which two parties have defined interests: the lessee, and the lessor. The Crown as lessor represents the general public. The public interest has been retained since European settlement because the land has been recognised by both parties to have particular characteristics which mitigated against its freeholding. The perceptions of these characteristics have changed over time. The 1948 Land Act adopted a formula for describing the values of pastoral land which many believe now to be incomplete. On the other hand, lessees have over the years been content to accept a form of licence which to some extent limited their risks.

The Department of Conservation recognises a range of "non-farming" or conservation values in pastoral lease land,

*Department of Conservation, Wellington

which are in effect public values. It acknowledges that in recognising these it is not alone; lessees for the most part also recognise them. For many they are a fundamental part of the high country way of life, and their continued existence owes much to the stewardship of successive generations of runholders.

Put bluntly, the lessee's interests under the Land Act are occupancy, and the right to pasturage under conditions determined by the lessor. The lessor's principal interest has been the receipt of rent, and the determination of the conditions under which the lessee might exercise his rights of pasturage, or be granted permission for any of the discretionary activities for which the Act provides.

Administration

Obviously the criteria by which the lessor makes these decisions, and exercises its discretions, are fundamental to the management of the land. Prior to 1986, these actions were determined within the framework of policies adopted by the Land Settlement Board, a body widely representative of runholders themselves. The full list of policies adopted and pursued by that body over the years would surprise many an avid conservationist.
The Board had a proud record of devising and adopting policies which recognised the advancing knowledge and developing attitudes of society generally.

Since 1986, these policies have been the basis of the Department's discharge of its responsibility for the land. The somewhat complicated administrative arrangements by which Landcorp have managed the Crown's interests under contract, with the advice and assistance of the Department of Conservation, under the overall umbrella of the Department of Lands which has retained the statutory responsibility for the Land Act, has worked extremely well.

The Rationale for change

The Ministers of Lands and Conservation in their addresses to the High Country Field Day at Mt White this

year have set out Government's objectives in preparing a new Land Bill.

The Department of Conservation itself has no specific responsibility for the Bill, but it obviously has a major interest in the outcome.

The administrative procedures in place from 1948, and operated since 1986, require the exercise of bureaucratic discretion within the framework of an Act and policies set by a Quango, with an appeal mechanism. This arrangement was a common one, and one which has been discarded by Government in many areas because it has been perceived to be inefficient, and to lack transparency and accountability. In short it lead to a "comfortable" understanding between the administered and the administrator.

The proposed new arrangements seek to clarify the responsibilities of the lessor and lessee; to separate where possible their interest and to provide, where this is not possible, a contractual agreement between lessor and lessee which will form a better basis for managing the various values of the land.

Recategorisation will recognise three classes of land: land which can be freeholded and on which the management constraints should be no more than those applied by society through law to all land; land on which the non pastoral values are such that there is no sensible pastoral use; and restricted use land, where there is clearly an ongoing pastoral value existing simultaneously with other non farming public values. It is in this land that the balance between production and non-production will be found, and where the integration of conservation and development must be practised.

The Department of Conservation supports the proposed recategorisation and subsequent negotiation process because:

(a) it will promote efficient use of the land, removing statutory impediments to the use of farmland and reducing

the costs of Crown administration.

(b) it will provide an opportunity for the trading of rights to the benefit of both parties - the commercial benefit of the lessee, and the non-commercial benefit of the lessor.

Recategorisation by itself achieves little. It is but a starting point for discussion and negotiation between Crown and lessee, leading in the words of the High Country Committee of Federated Farmers to "the use of wide ranging agreements and covenants, the negotiated exchange of rights and the restructuring of financial arrangements".

Recategorisation is essentially a zoning of the land according to its predominant value. As such it involves a value judgement, and the process by which recategorisation takes place will have to be very carefully designed and implemented so that the decisions reached are widely accepted as fair and reasonable.

Recategorisation as envisaged by the Ministers does not involve any reduction in lessee's rights; the only such reduction on a non-negotiated basis so far indicated is the imposition of rentals calculated at renewable lease rates on all land classified as farmland at the time of the next rent review.

The Department of Conservation's view of recategorisation is that it will provide consistent basis for the trading of rights within each property to the negotiated benefit of lessor and lessee, conservationist and farmer.

Restricted use land

The basis for the occupancy and use of restricted use land has not been made clear. The Department of Conservation envisages that these conditions would generally be a factor in the negotiations leading to the separation of interests between the lessee and the Crown. However, the Department recognises that over much of the High Country, such land

may be extensive and critical to the economic viability of properties.

Accordingly security is essential. We envisage an arrangement such as a rolling 30 year lease with re-negotiation every 10 years. Such an arrangement would give a lessee a minimum 20 year planning horizon.

The recategorisation process

The Department recognises the need for a process which is acceptable to, and provides opportunities for participation by, all parties. The process may require the establishment of a policy body, analogous to the old Land Settlement Board. The means by which the recategorisation process itself will be done, and overseen is yet undetermined. Perhaps there is a role for the reconstructed Mountain Lands Institute, or Lincoln College.

Certainly it is a process in which the Department of Conservation is interested, but one in which it cannot be nor would it want to be the predominant player.

The recategorisation is intended to provide the basis for negotiations; the process must be neutrally and dispassionately carried out, and not subject to the undue influence of either party to the subsequent negotiations.

Conclusions

Change is occurring in all facets of society and it is inevitable in the high country. The Department of Conservation acknowledges the central role that runholders have played in the management and maintenance of conservation values, and the crucial role that they will continue to have.

The process of recategorisation and the negotiations which this process is intended to both encourage and facilitate, presents an opportunity for the lessees, and the Crown, of which the Department is a vital part, to swim with the historical tide characterised by such concepts as accountability and transparency. The process

will build on the achievements of the past 40 years of stewardship, provide for high country farmers a more secure basis for the management of their economic interests and for the citizens of New Zealand a more certain recognition of the values of the high country for which it has been retained in Crown ownership for 140 years.

The process cannot, and is not intended, to be coercive. Categorisation is a basis for negotiation, not a blueprint, for each property and negotiations do not succeed without willingness to achieve results on both sides.

For each party, the outcome of successful negotiations is certainty - for the Department of Conservation - certainty that values which by their very nature cannot be replaced and can only be diminished by the influence of man are as well protected as possible. For the landholder, certainty of knowledge about his rights and obligations and certainty from the ever present possibility of external change imposed selectively on him by society through the Act. In short the land occupier will trade a much constrained set of rights always subject to the whim of Parliament for the certainty of freehold land and specific contracts.

Categorisation of Pastoral Land

P. Garden*

Introduction

Categorisation is the suggested process which entails drawing lines across a pastoral lease separating farmland, restricted use land, and conservation land. In order to draw these lines, a team of experts will be required to determine the significant historical, natural, recreational, botanical, zoological, cultural, and any other feature which may happen to be in vogue at the time. The impact of farming on these significant features will determine into which category that area will be put. The decision as to how the land should be classified will also be open to public submission which will serve to further increase the odds against the lessee.

Proposal

Certainly the negotiation will be between only the lessee and the lessor - and if it is not satisfactory to the lessee, he can walk away from the proposal and the lease will stay the same. However the rent won't stay the same. The land that has been designated farmland at the next rent review will be rented at the renewable lease rental rate, currently 4.5%. So we would have a situation where land was rented at renewable lease rates but would not be able to be freeholded until the lessee accepted the whole package. And we keep being told "that your rights will not be altered" and "the balance between lessee and lessor will remain as it was". We simple don't accept that. The contract has been changed.

---

*Avenal Station, Miller's Flat

A Scenario

Let's look at a possible scenario. Imagine we have a high country property running from a valley floor with some rolling terraces, up over a steep range and down the other side. The topdressed terraces along with a few holding paddocks and some lucerne flats in the bottom of the valley, carry a big proportion of the total stock numbers. Along the foot of the hill, the slopes have had occasional todressing, sufficient though that the once scattered patches of bracken have grown head high. (For bracken, we could substitute matagouri, manuka, snow tussock, fescue tussock, tauhinu, why not even browntop?) Higher up, the bracken/scrub zone changes into pure tussock cover until the top of the range is reached which supports an alpine plant ecosystem. Down the other side of the range, a similar altitudinal sequence exists.

Now, let's assume that the Crown decides to instigate the categorisation process. The lessee isn't happy, but he can't stop it anyway. For a month or two, the place swarms with experts, all identifying, discovering, inspecting, assessing, and riding every conceivable breed of hobby horse up and down the mountainside. While all this is going on, the process is of course open to public consultation and submission. I should perhaps have mentioned, a State Highway runs up the valley and a number of submissions refer to the landscape values afforded by the vigorous bracken and shrub associations.

The final categorisation proposal presented to the lessee for negotiation includes:

- All the terraces and valley floor to be categorised as farmland.
- The hill on both sides of the range up to 300 metres of the top to be restricted use land.
- The top 300 metres of the range to be conservation land.

The proposal for the restricted use land includes a completely new lease agreement - it will

not be a pastoral lease as the lessee had over his whole area previously but includes the right of public access up the track to the top of the hill, there is no right to topdress any ground not already topdressed, and to cap it all off, there is no right to apply for a burning permit on the area with the head high bracken because it is seen to have now become a significant feature of the natural landscape.

Well, our lessee chews all this over for a month or two with the Crown, - he's basically a reasonable bloke, and would like to help, - but eventually he decides it's too much and he would sooner stay with the *status quo*. Unfortunately there is now no such thing. His rent review is upon him and he finds the land classified as farmland is now being rented at 6%. (Uncle Landcorp had decided some time ago that renewable leases should be paying a more commercial rental). Although the farmland part of the property is not a big proportion of the total area, because it carries a lot of stock, its LEI is proportionally far higher. Consequently his annual rental skyrockets.

However that's not all. The Crown decides that a block stock limitation should be imposed on the land on top of the range which had been categorised as conservation land to protect the alpine plant association. Our lessee has traditionally shifted his stock from the terraces which dry out in the summer up over the top and on to the block which runs down the other side. It is impossible to fence the top off from either side because of the risk of snow damage so he is faced with substantially reducing his stock numbers. He argues that it's primary production that is paying the country's bills, that the fact that there is something up there of value proves his management must be in harmony with the environment, but it's all to no avail, the Crown is adamant, at that altitude, conservation is the prime land use, not production.

However, an opportunity presents itself. A neighbour

puts a block of land on the market - it's quite handy and will allow him to lift his stock numbers again. He has a substantial mortgage with the Rural Bank, which he borrowed to develop the terraces, but he is confident that his bank will lend him what's required.

"Look, I'm sorry" says the bank manager, "I can't afford to take the risk. I don't believe you have the necessary equity. You have a block of ground on which you are paying a renewable rental, but which you can't freehold, and on the rest of the property there seems to be an increasing emphasis on values other than production. I don't believe the market will value your property for farming purposes as highly as it has in the past. Try lotto." Thoroughly disillusioned, our lessee returns home convinced that he is being victimised by "those conservationists" on the one hand, and coerced by the system on the other.

Let's look then at what this proposed categorisation has achieved on this particular block of ground. At a substantial cost, (as yet completely unquantified by anyone) a host of subjective values have been identified. The "public interest" has been canvassed and reflected in a proposal submitted for one to one negotiation with the lessee. Although the lessee turned down the proposal, a convenient mechanism exists to either change his mind or force the desired protection. It's a no win situation for the lessee. Either he accepts the proposal with the associated constraints on his production or he turns it down, stomachs the increased rental and sees his production constrained anyway, courtesy of the block stock limitation and the refusal of discretionary consents. Heads you win, tails I lose.

And what about conservation, how has it fared? Well, superficially, it has progressed. Protection has been achieved but, at the cost of producing a lifetime
opponent - and what's worse, the very person who needs to be the most supportive. If categorisation and coercion

are to be the shape of things to come in the high country, then I can only say that I think it will be bad for conservation and bad for pastoral lessees.

Categorisation of Pastoral Leases

A commentary

K. Mouat*

I want to start with the myth of this reclassification under section 51 of the Land Act.

Section 51 states:
"All Crown land available for disposal under this Act may be classified by the board into...."

and lists four categories:- farm, urban, commercial and pastoral. And states:

"The Board may from time to time re-classify any land which has been classified under this section."

The point I want to make is that the Board has classified land that has been available for disposal. The Board has disposed of it under pastoral lease and now can reclassify it into farm land. But it cannot re-classify it into DOC land or UCL - Unoccupied Crown Land.

Section 52 then tells us that the Board may alienate Crown Land on any tenure. Alienation as defined includes a limited disposal by lease or licence as well as an absolute disposal by sale or otherwise. So the Board has determined that this land is available, it has disposed of it, alienated it according to the Land Act. It has been disposed of from the Crown's Estate to a private individual.

People have been using that term 'ownership' loosely. Apart from freehold, all other tenures under the Act are owned by the Crown by

---

*Solicitor, LandCorp, Christchurch

definition under the Land Act. So we see that ownership by the Crown applies to all those particular leases and licences listed.

I will now briefly go through the history of the proposals leading up to the Land Bill. LandCorp was represented on the Officials Committee. The first paper was prepared by Lands Department. As it was concerned with the large areas of pastoral leases, they were asked to prepare a further paper. Lands Department submitted that pastoral leases should remain with the Department of Lands; Landcorp should manage them. Procedures, including requirement for public involvement, would be laid down for authorising the cancellation of the pastoral classification. Block stock limits would be imposed, and a catch-all phrase guards against soil disturbance.

They suggested lessees could continue to exchange a pastoral lease for renewable lease or go straight to a freehold tenure. Lands Department added:

"some minor amendments are intended."

Now that paper was with State Services Commission, Lands Department and Treasury, so Lands were the only ones that knew anything about land at that point. Then in November 1988, Conservation, Environment, SSC, DOSLI, Trade and Industry, Maori Affairs, Tourist and Publicity, Justice Department and ourselves were added to this Committee, so you can see what sort of committee we are dealing with, a whole lot of people that have totally different view points.

It was suggested that pastoral leases would require a new multi objective type lease and that the present rights and privileges of lessees should be protected and at the same time provide for protection of the public conservation values - natural, historical and recreational. The Land Bill should provide for the administration and re-classification of pastoral land and for the preservation of the natural, recreational and historical values of such land.

So that is where the committees have been working from of late.

Lands Department have said the identification exercise is largely a DOC function with public input. I would like to know whose function it is going to be. We've already heard that Lands Department is not legally in existence at the present time, but will be from the first of the month, but that's only for another year according to the Bill. So where is all this categorisation going to really lie? Is it going to be with DOSLI? Is it going to be with Lands? Is it going to be with DOC? And that's something we have to be concerned with. Hamish Ensor, the Chairman of the High Country Committee, came to one of the Committee meetings and he asked at the end of the submission, "then why the change?" No one answered, so I said it was to give the conservation people some legal teeth and the Conservation Department man quietly said to me, "You're bloody well right you know." He wouldn't tell anybody else.

What about philosophy? If we look at the provisions of the Land Bill itself we can see where the weight is weighted. One interesting thing was that in the categorisation list farm land was at the bottom; now it is on top but it doesn't give it any greater weight of course.

Under 'Management Objectives', the Lands Department document states:

"In assessing applications by pastoral leasees for consent to disturb the soil or vegetation these factors will be taken into account:

- The importance of continued and sustainable agricultural, pastoral and silviculture production.
- The need to minimise soil erosion, of flooding, and maximise soil retention.

Then we have a big list of conservation things.

- The need for conservation of natural values.
- The protection of certain areas or features with a view to safeguarding natural history, retention of representive examples of indigenous biota and

preservation of major ecosystems as far as possible in their natural state.

- The preservation of significant natural landscapes and the management and preservation of culturally modified or integrated landscapes where they are compatible with natural landscapes.
- The need for protection of historic and archaeological sites and for cultural sensitivity in land use.

Who is to manage this land in the future if it's taken out of the pastoral lease? The land is being farmed now. What is going to happen to this land when it is locked up? Is it going to improve? We don't know. The problem of rabbits has already been mentioned. When the PLC (Public Lands Coalition) came to one of the meetings, at the same time as Federated Farmers, they suggested that there is in fact no freeholdable land left, so they are going to be making public submissions. If Pat Garden's scenario is to be taken seriously we will indeed find that the weight is totally against the farmer. There will be a lot of people swarming over his farm before categorisation occurs and before public submissions are heard. These experts are going to look at the land. There will be only one person on his side and that's himself. Landcorp certainly does not have a role in the negotiations at this point. There is no one on the farmer's side but we will have DOC, Public Lands Coalition and others making submissions.

One thing that Pat didn't mention is that on this valley floor is a river as well as a main highway. And there's a marginal strip going to go against that river. We don't know what the marginal strip legislation is going to say yet but I do know there are moves afoot to increase the width of marginal strips. I do know that if you want to use a marginal strip you will have to make application.

The marginal strips legislation is more than just a repeat of Section 58. Provision is to be made for the strip to move with the river.

I think Mr Garden summed it up quite well when he said:

"If categorisation and coersion are to be the shape of things to come in the high country then I can only say I think it will be bad for conservation and bad for pastoral lessees."

I think that is a true statement.

Turning to the Department of Conservation's paper on categorisation, one of the first things I noted, was that the Department of Conservation has a mandate by Cabinet at this point to do certain things. Of course this is why the categorisation process is being put into legislation; it will be more than a mandate by Cabinet it will give the Department of Conservation their legal teeth. The DOC paper refers to perceptions of changes. Let's not forget a lessee has a lease that's been in existence for some time and if you want to change those things you must clearly negotiate with that lessee.

Reference has been made to the Land Settlement Board policies and the Lee case. The Crown Law opinion about the Lee case has brought other things to light, viz. that many (and I'll say many, many) of the policies of the Land Settlement Board have been considered to be ultra vires the Land Act, including the public scrutiny, and the public's rights of re-hearing. So it may be true to say the public have been involved up to this point, but erroneously so. So let's be careful, when reading high country policies, that we sort out which ones are according to law and which ones are ultra vires.

DOC says the Department of Conservation itself has no specific responsibility for the Bill but it obviously has a major interest in the outcome. My question is, who is going to ultimately have the responsibility for this categorisation process? I don't know, I don't think DOC knows and I don't think Lands knows at this point. I guess we have got to wait for Government to decide what is going to happen to the Department of Lands. DOC

also say the process cannot, and is not intended to be, coercive. So we see that the farmer and the conservationists use that same word. It says categorisation is a basis for negotiation, not a blue print for each property and negotiations do not succeed without willingness to achieve results on both sides.

I go back to what Mr Ensor asked the Committee, "well, why the change?" Both sides could negotiate on the pastoral lease as it is now, take land out of the pastoral lease, and put in conservation convenants.

There are many mechanisms there to protect conservation values at this point. I personally don't think that the categorisation process is essential.

What are they doing about rabbits?

I.G.C.Kerr*

Introduction

From 1 November 1989 -

- there will be no pest destruction boards,
- there will be no Agricultural Pest Destruction Council.
- regional councils will be responsible for pest destruction,
- regional councils and the Ministry of Agriculture will be implementing a comprehensive rabbit and land management programme for extreme and high rabbit prone land.

From 1989 onwards there will be no taxpayer input to rabbit control operations apart from the central government component of the rabbit and land management programme.

Reform of Local Government

The most sweeping reform of local government in New Zealands history will be in place from 1 November 1989. There will be 74 city and district councils responsible for delivery of community services. There will be 13 regional councils responsible for the management of natural resources.

Regional councils will set the policy, decide the funding and arrange for the control of agricultural pests. Noxious plants will be managed the same way.

Regional councils will be required to prepare resource management statements for their region. These documents will establish the policies for the use of natural resources including land. These policies may affect the councils' approach to pest control.

---

*N.Z. Mountain Lands Institute, Lincoln University

Administration

Vertebrate pest control in New Zealand has hitherto been the responsibility of a special purpose administrative structure comprising pest destruction boards responsible for control operations and a central government quango which supervises the boards and allocates available taxpayer funding.

Plant and animal pest control administration in New Zealand was the subject of a recent government-sponsored seminar, the purpose of which was the clarification of the issues and options for the future administration (MacIntyre *et. al.*, 1987).

At the seminar six basic components of successful pest management were identified viz. administration and funding; field operations; training and licencing; research; surveillance; and emergency ready reaction.

Criteria which can be used for evaluating administrative structures include:

- appropriate scale
- fail safe
- adaptable to changing conditions
- accountable
- effective and efficient
- scope for conflict resolution
- equitable

The option most favoured for the future was an administrative model which assigned autonomy for pest control to local organisations and limited the role of central government to the formulation of national policy and legislation. Some participants were loath to see the demise of the Agricultural Pest Destruction Council and the Noxious Plants Council with their associated commitments to taxpayer input to pest control and ready access to government. Government obviously thinks otherwise.

The recent reforms in local government will result in the responsibility for pest administration being vested in regional government. Regional councils will be responsible for policy and funding. Regional councils will seek to have field operations carried

out by land occupiers, contractors, or their own staff as appropriate. The likely arrangements are shown on the following page.

Outcomes of the rapidly occurring reforms of local government administration in New Zealand include:

- separation of the policy and funding aspects of vertebrate pest and noxious plants control from field operations,
- an integration of pest control programmes with comprehensive resource management plans for land and water.

It is clear that the whole emphasis for any public intervention in the control of rabbits has shifted from the protection of agricultural production to the protection of land resources.
It is also clear that, except in extreme and high rabbit prone land, the responsibility for the cost of control will fall fully on land occupiers.
Research and operational experience has established criteria for the successful control of rabbits on low to moderately rabbit prone land.

Strategies have been advanced (Rabbit and Land Management Task Force 1988) for the control of rabbits as a serious pest on extremely and highly rabbit prone land. For these strategies to have any chance of success regional councils will need to accord a high priority to the development of management plans for this land.

Rabbit and Land Management

Government has endorsed, in principal, the recommendations of the Rabbit and Land Management Task Force set up to recommend on an integrated land management programme for the intractable areas.

The programme will be implemented by regional government.

This programme will be effected through comprehensive rabbit and land management plans for affected properties or groups of

properties. The emphasis of the programme will be on the protection of the land resource. These will be in effect extensions of the existing soil and water conservation plan programme as currently operated by catchment authorities (now Regional Councils).

The programme will be facilitated by the Ministry of Agriculture and Fisheries.

Government will review the programme after five years.

Government has noted that the programme may involve the resumption of land by the Crown or compulsory retirement of land.

Central government taxpayer and regional ratepayer funding of the programme is shown in the table on the following page.

Approximately 60% of the costs of the programme will be borne by the national taxpayer. Government intends that regional ratepayers contribute a further 30% and that the occupiers of the extreme and highly rabbit prone land contribute approximately 10%.

It will be necessary for agreement to be reached between the relevant regional councils and the Minister of Agriculture concerning the implementation of the programme.

The Ministry of Agriculture and Fisheries will audit and review the programme as necessary.

The Ministry of Agriculture and Fisheries will, subject to satisfactory progress of the programme, annually allocate funds to the relevant regional councils. The allocation will be made according to the extent of the area of land of extreme and high rabbit proneness within each region.

The Ministry of Agriculture and Fisheries will maintain a rabbit pest surveillance programme to monitor the effectiveness of the integrated

Table 1: Central government taxpayer and regional ratepayer funding

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	TOTAL
Central	3.00	3.90	2.79	2.79	2.79	1.08	16.35
Regional*	0	1.17	2.29	2.29	2.29	1.08	9.12
Occupier*	0.50	0.50	0.50	0.50	0.50	0.50	3.00
TOTAL	3.50	5.57	5.58	5.58	5.58	2.66	28.47

* includes pest control and general rating

rabbit control and land management programme.

The question of whether either central or regional government or both will maintain a long term commitment to the partial funding of this programme is not yet clear. It is my contention that without (and probably even with) the introduction of a virus as an alternative means of rabbit control, publically assisted funding of comprehensive rabbit and land management plans is essential for the achievement of a sustainable management regime for the extremely and highly rabbit prone land of New Zealand.

The 1988/89 level of grants from central government for pest destruction is shown in parenthesis in the following table. Rates are expected to increase proportionally to match the 1989 grants.

The funding of comprehensive rabbit and land management plans is essential for the achievement of a sustainable management regime for the extremely and highly rabbit prone land of New Zealand.

The level of rates and government grants for pest destruction revenue in the 1987/88 year for regions which will be involved in this programme is shown below:

Table 2: Regional rates and grants revenue 1988/89

	Rates	Grants		Total
	1988	1988	1989	1988
Marlb/Nelson	$0.3m	$0.3m	($0.2m)	$0.6m
Canterbury	$2.0m	$0.8m	($0.5m)	$2.8m
Otago	$2.0m	$1.6m	($0.9m	$3.6m

It has been estimated that the amount of pest destruction rates paid on extreme and high rabbit prone land is approximately $0.5m (Rabbit and Land Management Task Force 1988). It is self evident that the expected $9.0m contribution from regional government to this programme is substantially more than the present cost of rabbit control in the affected regions. It is yet to be determined how this funding is to be arranged.

Regional councils may wish to consider if their involvement in this programme can be supported from present or additional funds allocated for soil conservation activities.

Rating

Following the reform of local government, regional councils will assume the authority to rate land occupiers for agricultural pest destruction and for land protection as set out in the recent Rating Powers Act 1989.

In relation to agricultural pest destruction, regional councils are authorised to make and levy:

- a general rate which may be vary between parts of the region, and may be uniform (either on capital value or land area) or differential (according to the degree of infestation, benefit, risk, land occupier control, land use,

or other 'relevant circumstances'),

- a works rate which also may be for part of the region, and be on either a uniform or a differential basis.

It has been the practice of most pest destruction boards to meet the costs of administration from a general rate and fund pest control from a combination of a works rate and grants from central government.

The functions of regional government will include those of catchment authorities. Like pest destruction boards, catchment boards may levy both general and differential rates. Some catchment boards use funds from general rates to supplement the taxpayer funded incentives offered to land occupiers to undertake approved land protection (soil conservation) programmes.

Regional councils are also authorised to levy general and works rates for all or part of the region for undertaking any function or providing any service for the benefit of all or part of the region.

In relation to pest destruction, it will be necessary for the newly established regional councils to decide what the form of pest destruction rating should be. Councils will also need to decide if any general regional rates should be used in support of pest destruction. It is presumed that the case for regional funding (the use of general rates) would rest on priorities for the use of available regional funds, and the merits of providing incentives for protection of land resources.

On the basis of pest destruction being a normal business cost of farming it is difficult to see any rationale for central or regional funding of rabbit control on land other than that covered by an integrated land management programme. The funding of normal rabbit control activities will, it seems, henceforth be borne wholly by the affected land occupiers.

It is self evident that regional councils will need to establish an equitable form of classification for pest destruction over the whole of

its region. It is submitted that the basis of classification (and therefore rating incidence) should reflect pest proneness.

Classification of land according to rabbit proneness is certain to form the basis of rating land occupiers for the costs of rabbit control. It is also certain to be the basis for determining the land use changes indicated by the economic and technical realities of rabbit control on the semi-arid land of New Zealand.

The proneness classification reflects the potential of the different classes of land to sustain varying populations of rabbits approximately on the scale shown on the following page.

Economics

Over recent years there has been a concerted attempt by the Agricultural Pest Destruction Council and the relevant agricultural pest destruction boards to achieve a more effective level of control of rabbits on the heavily infested areas of the South Island.

What has been of greatest concern is a reduction in the effectiveness of poisoning operations in some local areas. It has been concluded that a significant proportion of these local rabbit populations are neophobic or 'bait shy' as a result of selection pressure over 35 years of poisoning (Rabbit and Land Management Task Force 1988). As a result of less effective poisoning the cost of rabbit control on highly rabbit prone land has escalated substantially as pest control organisations have increased the intensity of their operations.

One administrative response to the problem of less effective control is amalgamation of boards with the objective of achieving greater efficiencies and the direction of reduced tax money to the location of the problem.

The cost of rabbit control in a given locality is, in general, directly related to the number of rabbits surviving in that locality. Excluding low producing high altitude land

the inherent productivity of land is inversely related to the proneness of that land to infestation by rabbits.

As shown in the diagram on the following page the cost of rabbit control on extremely and some of the highly rabbit prone land exceeds the pastoral revenue from that land, often by a considerable margin. For the extremely rabbit prone land (and probably much of the highly rabbit prone land) major alterations in land use (and possibly tenure) are necessary to achieve a sustainable of use and conservation of the soil resource.

On a system of funding rabbit control by rating based on the degree of rabbit proneness it is obvious that revenue earned off extremely rabbit prone land and quite probably much of the highly rabbit prone land will not be able to meet the costs of control. Unless landholders are in a position to 'subsidise' these costs with revenue derived from other affected land on their holding then entire farming units will be financially unsustainable.

Where the costs of pest (rabbit) control to holders of the extreme and high rabbit prone land becomes very high it is probable that some land occupiers will wish to dispose of the land, presumably to the Crown. Should this happen the Crown will be obligated to meet these costs fully.

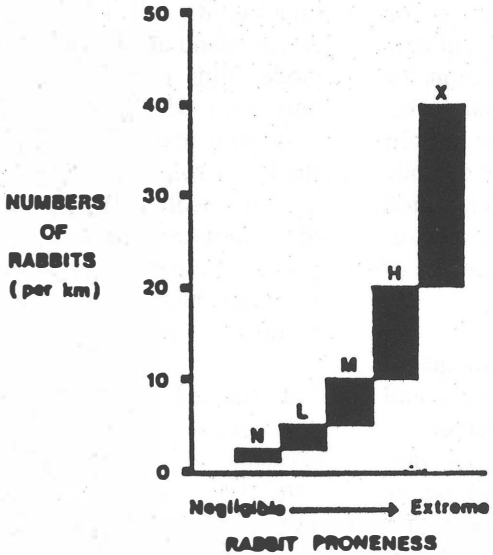
Land Management

The predicament confronting affected land occupiers has raised land use questions which initially they, and ultimately regional and central government needed to address. The issue of greatest concern to affected land occupiers and to the nation is the determination of the optimum use of the affected land including determination of the responsibility for the costs of rabbit control. The options appear limited.

Myxomatosis

To most affected land occupiers the most plausible option is the introduction of myxomatosis as a means of rabbit control. After considering the mandatory environmental impact

RELATIONSHIP BETWEEN RABBIT NUMBERS AND RABBIT PRONENESS

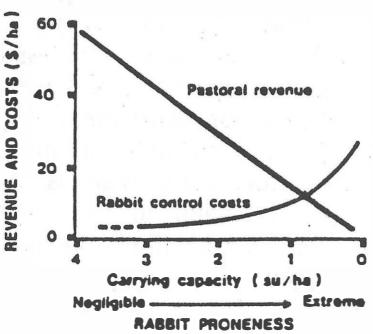


N.B. N = negligible, L = low, M = medium, H = high, X = extreme.

reporting procedures (Bamford and Hill 1985, Parliamentary Commissioner for the Environment 1987). Government did not sanction this approach.

Directly as a result of the audit investigation a task force was especially convened. The task force recommended that:

RELATIONSHIP BETWEEN THE PASTORAL REVENUE RABBIT CONTROL COSTS AND RABBIT PRONENES:



From Kerr et al 1983.

- government funding to support rabbit management be continued primarily for resource protection but also as partial compensation for the denial of myxomatosis,
- a consultative group within regional government compile and manage integrated resource management plans including the investment of public funding.

It is never-the-less anticipated that, if the myxoma virus and its rabbit flea vector is successfully introduced into New Zealand, it will be an efficient and economic means of rabbit control (Ross 1987).

However, to put myxomatosis into perspective it is well to reflect on the opinion of the doyen of myxomatosis research (Professor Frank Fenner of the Australian National University) that myxomatosis "...is a somewhat erratic ally to the methods of direct control...rather than as the sheet anchor of the rabbit control programme." (Fenner 1959).

It is crucial that a sensible and long term approach be taken to the myxomatosis issue. For the extreme and high rabbit prone land of the South Island all the means of moderating rabbit numbers must be used. These include poisoning, predation, fencing, stock control, modification of habitat, and if feasible, the use of biological agents. The problem is so serious that one technique alone is unlikely to be effective for long.

The planned rabbit and land management programme should at least create conditions where the myxoma virus, even within partially resistant populations of rabbits, will have some effect.

Service Delivery

Over recent months there has been much debate about the topic of who and how is pest destruction to be carried out. Proposals range from a not too subtle attempt to recreate pest destruction boards in the form of autonomous companies wholly owned by the regional council to an unceremonious grab for the role by district councils.

The important criteria of accountability, efficiency and

effectiveness have not been given due weight.

The options available to regional councils for effective and efficient field operations include control by land occupiers, contractors, or regional council staff. Obviously, for different localities, each option needs careful evaluation.

Staffing

With the advent of regional government we, at long last, will see an integrated approach to land management. For far too long pest boards, county councils, and catchment boards (and the departments and enterprises of the State) have acted independently of one another. For instance, there has been a rabbit problem for over one hundred years in Central Otago, and it is only now we are to see a comprehensive approach to the land management issues of this 'intractable' area. Numerous other examples could be quoted, particularly in the fields of weed control, and in the administration of land and of fire.

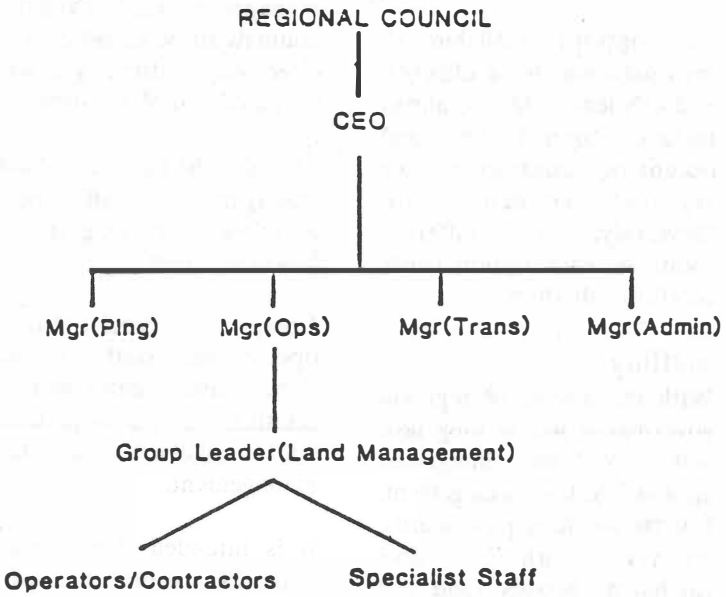
A result of this change will be a requirement for the land management staff of regional councils to be capable of effectively addressing a wide range of complex issues.

I foresee the operational land management staff being arranged per diagram on following page.

I believe it is crucial that the operational staff outlined above have a close working relationship with any planning staff involved in land management.

It is intended that regional councils establish rural services committees. It is questionable whether these committees will be able to greatly influence the land management or funding policies of their respective councils. That power lies with the full council.

It is also been proposed that some regional councils may establish local liaison committees to advise on pest control matters. Such an arrangement will surely be useful in dealing with local



issues but otherwise will have little influence on policy. In reality the day of pest boards has gone. Pest destruction ratepayers will only be indirectly represented through liaison committees. The policy makers are no longer the pest board trustees. That role lies with regional councillors and their advisors. Nevertheless it is to be hoped that the liaison committees may be permitted to play a useful role.

Conclusion

The whole field of pest (and weed) administration is being drastically changed. We are about to see the end of the era of the pest destruction board.

Henceforth regional councils will be responsible for most aspects of land resource management including pest control.

Generally, occupiers will be responsible for all the costs of pest control on their land.

It is likely that control operations will be carried out by land occupiers or contractors or regional council staff - which ever is the most efficient and effective in a particular locality.

Public funding of rabbit control will be concentrated on key limited areas of concern. The emphasis will be on resource protection through integrated management plans.

I suspect this will be the pattern for the control of all vertebrate and plant pests in the future.

References

Bamford, J. and Hill, J. (1985). Environmental Impact Report on a proposal to introduce myxomatosis as another means of rabbit control in New Zealand. John Bamford and Associates, Nelson. pp 163 plus appendices.

Fenner, F.J. (1959). Myxomatosis. Proceedings of a conference entitled The Rabbit Problem In Australia convened by C.S.I.R.O., Melbourne.

Kerr, I.G.C. and W.D.Ross, (1989), Classification of land in Central Otago for rabbit proneness, Research report, Centre for Resource Management, Lincoln College. (in prep)

McIntyre, A.A., Scaife, M., Leathers, K.L. and Kerr, I.G.C., (1987). Pest control administration in New Zealand : The issues and options. Discussion paper, Tussock Grasslands and Mountain Lands Institute, Lincoln College.

Parliamentary Commissioner For The Environment. (1987). Investigation of a proposal to introduce myxomatosis as another means of rabbit control in New Zealand. Volume 1, Office of the Parliamentary Commissioner For The Environment, Wellington. pp 112.

Rabbit and Land Management Task Force. (1988). The report of Rabbit and Land Management Task Force to the Right Honourable C.J.Moyle, Minister of Agriculture, Mosgiel. pp 88 plus appendices.

Ross, K.C. and Arthur-Worsop, M.J. (1987). A preliminary economic evaluation of rabbit control. Resource use paper 3/87, MAFCorp, Min. of Agric. & Fisheries, Christchurch. pp.28.

What are they doing about rabbits?

A Commentary

G Lucas*

Introduction

I have farmed a small sheep run in the Lindis Pass since 1961. This little place has treated me very kindly really, even although it is very dry in summer and cold in winter, grows briar extremely well and had a history of being a great little rabbit block and indeed is today.

I first got involved in the local Pest Board around 1970, about 10 years after the old Rabbit Boards had broken the back of the main problem. It was about this time that Governments started looking at various ways of exterminating Pest Boards.

So I am very used to the 'banging the head against a brick wall' syndrome. To me it is very heartening to have a last something positive happen in the form of the Task Force report being actioned.

Whether we like it or not we are stuck with this Task Force report for the next 5 years and I for one would like to wish those involved the very best of luck.

I recently looked up a brief history of the early days of the old Lindis Rabbit Board and it is very interesting reading. In the late 50s early 60s when rabbits were at their lowest level for at least 70 odd years, there were 25 to 26 men employed. They were servicing about 175,000 acres

---

*Nine Mile, Lindis Valley

and another 25,000 acres were poisoned. If we allow that it would cost about $40,000 a man to manpower this country now, and each man was able to look after say 3,000 hectares (based on 1959 figures), that would mean for every 100,000 hectares $1,320,000 of Task Force money is eaten up with wages and other associated costs which by my calculation doesn't leave much of the Government money for other Task Force strategies.

You may say this is a gross exaggeration of costs but on 300,000 hectares (the area the Task Force is talking of) that adds up to nearly $4,000,000. Even if you required half that amount of manpower it still adds up to about two million dollars and with rabbit netting at $2 a metre I fear that the money allocated will not be enough.

The other thing I find a little frightening about the Task Force is the scientist's remarks about the sowing of Thyme and reference to Molesworth. If we had only run cattle instead of sheep in Central Otago over the last 30 years we would have all been down the road long ago. The sheep have taken far too much blame for the state of the country in Central, whereas if we look on the positive side they have brought prosperity and jobs to the area and when we think of the briar and hieracium problems they are a very big plus to the landscape of Central. Perhaps we should be blaming the farmers not the sheep!

Complicated classification of land for rabbit proneness is in my opinion unnecessary except to establish the areas the Task Force will target. A far simpler method would to be rate for work done plus administration. Of course the land we are referring to may only have work done on it every 4 to 7 years so rather than the farmer facing a very large rate every so often, it would need to be averaged out, say over a 5 year roll over period.

This method would also have the advantage of reimbursing the farmer who, through his own management or his own

control work, can keep his poison jobs further apart. The more the farmer ratepayer is able to achieve in that direction the less work rate over the years he will have to pay.

This may of course create another problem in that some farmers may be tempted to ignore their rabbits especially when times are hard, or refuse a poison when a neighbour's management leaves clean country exposed to reinfestation.

So we must retain the power of the Pest Destruction Act and we must endeavour to have that power at a local level. Regional Government must delegate back to local companies or committees the power to enter and the power to inspect.

What of a poison failure? This of course does and will occur even in country that is not often poisoned due to factors beyond the control of the pest destruction people.

I believe that even though these farmers are funding their own operations there should be a safety net at the bottom of the cliff in the form of Government monies for some follow-up work or a free poison.

After all it is these farmers too who are being denied by the New Zealand Government and people the most (in their eyes) economic form of control, myxomatosis.

The possibility of a poison failure is of course the main reason why taxpayers have a responsibility to at least fund monitoring work and some staff training.

I mentioned farmers doing their own control work because there is a feeling in Central Otago that farmers want to do some of their own control work to keep their rates down.

My own feeling is that after a successful poison some runholders could help themselves far more by some careful management of these blocks and by perhaps some closer subdivision, oversowing and topdressing.

Economics

The concerted effort which Mr Kerr referred to and that of local Pest Boards to achieve a more effective level of control on heavily infested areas by A.P.D.C. doesn't wash with me. The A.P.D.C. has been guilty of spreading an ever decreasing amount of T.P.I. more and more thinly over all Pest Districts instead of targeting funds to areas of most need. Local Central Otago Pest Boards have been forced by economics and the A.P.D.C. directives to rely almost completely on carrot, oats and 1080 poison with little or no follow up work.

Level of Rates

The rates that Central Otago had to set this year to meet their budget are really quite frightening and it is just as well that wool prices are where they are at the moment. Even so there has been quite a bit of asset selling (mainly houses) to balance some ward budgets. The incoming Regional Councils must explore all other avenues for revenue as the farmers of Central Otago are paying more than their fair share now, indeed many of them will be fully funding their own pest destruction programme.

Of the other funding avenues the Department of Conservation should be courted, as the riverbeds and riverbanks of the South Island are the ideal habitat and breeding grounds and there are plenty of examples of them spreading out onto good farm land from these havens.

But the farmers on rabbit prone country are going to have to budget and farm on a 'rabbits first' policy from now on.

Recently Central Otago had a visit from the newly appointed Manager of the Regional Council along with Sir John Thorn, Chairman of the Transitional Committee. Since then we have had a heartening letter from Bryan Bang, the General Manager, in which he advocated leaving the existing structure as much as possible as it is at present with the existing Boards in

Otago becoming committees of the Regional Council.

We in Central have always believed, since being forced into this corner through the great Government restructuring plan, that if we could not win the company structure idea that this was a very good second option.

What I would like to see in place is an overall manager based in Alexandra responsible for the planning, budgeting, coordination of manpower and plant etc. The supervisors could remain much as they are now, responsible for the day to day running of their own area.

At this stage I am not sure how the Central Otago committee would be elected but there could perhaps be an informal election in Ward areas or just appointment through Federated Farmers. I would also be keen to see representatives from Catchment Boards, Department of Conservation and Lands Department as the emphasis is moved away from agriculture production to environmental and land protection.

In summary the main points, I would make are:

1. Let all runholders and farmers (wherever the rabbit is a problem) support the new Regional Committee - and their local committees not forgetting the experts in the field, the supervisors, foremen etc.

2. Land management. The farmer rather than the sheep would have to take the blame for any over grazing (Environmental Impact Report and Task Force Report). Sheep play a very important role in helping to control many undesirable weeds especially briar and hieracium.

We as farmers will somehow have to stop the practice of ringing the supervisors after a poison to see how soon we can restock the blocks to eat off any fresh feed that may have grown since the poison. We have to give the land a bit of a break and give it some time to recover.

3. To many of you who feel you have a rabbit problem but will miss out on any Task Force money I say be thankful. I think there will be so many tags with these monies that it could be a great big relief not to be involved. There are no free lunches these days.

4. I would like to offer some advice to the 'academics' and the paper shufflers of the new Regional Councils. There have never been many rabbits killed with PAPER.

The rabbit control efforts of the past have been based on knowledge and cooperation at a very local level. And with most runholders paying for their own control work they will be looking to those, in words of the moment, for accountability and transparency.

They may tolerate paying for their own control work but there is no way they will put up with great heaps of money going into administration.

Pest Boards of the past can be proud of their lean and hungry administration costs so let's make sure it is kept that way.

Remember those 25 men working on the old Lindis Rabbit Board 30 years ago were being serviced by one inspector and a part time secretary.

Please make sure as many dollars as possible are spent on field work because if you don't you will end up with total farmer revolt and the clock will be turned back 40 odd years.

Let us remember - myxo or no myxo - Task Force money or no Task Force money - new methods or old methods - as long as there are two rabbits of the opposite sex on the warm, sweet, dry country of the South Island we will need to be constantly on the alert for ever. Finally in thanking you for the opportunity to address you on this important subject, I would close by emphasizing that comments expressed are my own views and do not necessarily reflect the views of the Central Otago Pest Board.

Rural Fire Review

G. Hensley*

Introduction

Thank you for inviting me to this conference to speak to you on the Government's Review of Rural Fire Services.

The first question to be answered is probably 'why is the Coordinator of Domestic and External Security conducting a review of this kind?' My role is to act, as the title suggests, to coordinate the government's actions on security issues. We define security very widely and it includes not just the obvious issues of defence and intelligence affairs but also aspects which directly affect the well-being of citizens. My office for instance, was responsible for coordinating the recovery operations after Cyclone Bola and after the Greymouth floods last year.

We were asked by the Prime Minister to conduct this present review because there were claims that people in rural areas faced an increasing threat of fire, because we are independent, and because we have had some experience in providing reports on issues which cross a variety of competing interests.

Background

The review was initiated as a direct result of the fires at Dunsandel in December last year. At that time claims were made that the safety of the rural population was at risk from fire because the NZ Forest Service, which previously had provided

---

*Co-ordinator, Domestic and External Security, Wellington

protection, had been disbanded.

Our preliminary report to the Prime Minister showed what everyone here knows:

(1) that the present system based on the Forest and Rural Fires Act is sound, but

(2) that it has significant shortcomings because there is no authority to set national standards and ensure that they are met; and there are weaknesses of coordination between rural fire authorities.

We concluded that although the disbanding of the Forest Service had not changed the responsibility of the rural fire authorities to provide proper protection it had diminished the overall capacity through staffing reductions and cut-backs in fire awareness campaigns.

As a result, in my preliminary report, I recommended to the government that a full scale review was needed to answer the questions 'how can fire services, including fire prevention campaigns, best be provided in rural areas' and 'how best to match limited resources to an unquantifiable risk'.

The review has been conducted over the last three months culminating in a draft report which Cabinet last week agreed should be used as the basis of further consultations and discussions with the rural fires community. These consultations are in effect beginning here today. Over the next three weeks I and members of the Committee will be travelling to Dunedin, Christchurch, Nelson, Palmerston North, Rotorua and Auckland to meet with Rural Fire Coordinating Committees, those who presented submissions on the issue and other interested parties. After these consultations I hope to present a final report to Cabinet by mid-August.

The Review

Before I discuss the report and its conclusions let me briefly talk about the review process. A review team, a committee, was formed with

representatives from the core interested departments, Internal Affairs, Forestry, Conservation, the Fire Service Commission, and chaired by me with a colleague from the DESC Secretariat as Secretary. As many of you will know we invited submissions - receiving 73 from the principal rural and forestry organisations including this Institute - and held two public meetings to discuss the major points - again this Institute attended one of the meetings. From all this we were able to discern the range of opinion held on the issue and the most sensible avenues for rectifying the shortcomings.

The two main areas of concern are structure and finance. There is general agreement that the present system of rural fire authorities relying on volunteers is the right one, but opinions have differed over whether there is value in establishing a national mechanism for setting standards and checking them and in conducting national awareness and prevention campaigns, training, coordination of equipment and communications and other national level tasks. And if a national authority is established, who should play the major role, the Ministry of Forestry or the Fire Service? Financially, there is considerable concern over the perceived inequities within the fire service levy and with the ability of fire authorities to gain access to the Rural Fire Fighting Fund.

In considering these broad issues we were able to formulate some operating principles against which to measure any proposal:

- there is a need to simplify the current system which has a variety of statutory and ad hoc bodies responsible for providing fire services;
- the provision of fire services should continue to be locally-based and a local responsibility, based now on the local government reorganisation being completed this year;
- there will be a need for coordination at a level higher than the local community;

- there is a need for a 'national authority' which can set national standards over a range of subjects;
- any proposal has to be approximately fiscally neutral. In other words it is unlikely that the government, the insurance industry or the ratepayers will pay much more than at present;
- rural fire authorities need to have the financial assurance to be able to attack potentially major fires quickly and with sufficient force to quell them before they become major fires. Easier access to funds should save money in limiting economic loss and lessening the number of large fires to be fought.

The results

That is the background. Now what have we proposed. I will not go into too much detail. Instead I will describe the outline and explain the reasons where necessary. You will see that mostly they can be related back to the broad principles I have just given.

Firstly, structure. We propose a three tier system. The first, operational, tier would be responsible for the direct provision of services. It would closely resemble the present local and territorial arrangements except that in place of the present complicated terminology there would be only one organisation as the basic building block of the system: the Rural Fire Authority. These Rural Fire Authorities would include:

- all Districts and Cities with rural or forest areas;
- Government Departments with significant rural land holdings (Conservation and Defence);
- private landowners who are willing to meet the obligations of becoming an RFA.

This is a much simpler system than at present and it ensures that the fire services will continue to be responsive to local needs.

The second tier concentrates on coordination. We base this upon the new Regional Councils. Each Council will

have a regional fire officer who will maintain the regional fire plan and coordinate activities within the region. He or she would chair a regional coordinating committee with a membership consisting of representatives of all the RFAs and the Fire Service.

At the top will be a national authority with statutory powers. It will be small and will have no operational or firefighting responsibilities. Its major role will be to establish national rural fire standards and to ensure that they are maintained. It will ensure common specifications and interoperability of equipment, carry out national training and certification, and organise national fire awareness and prevention campaigns. It will also administer the Rural Firefighting Fund and through this will be able to exert a significant leverage on RFAs or regions who do not carry out their statutory obligations.

We recommend that the national authority be the NZ Fire Service, which would establish a small rural division to carry out these tasks. It would not have any operational responsibilities.

We had considerable discussion on this point. The national authority will be too small to stand-alone. Logically it should form part of either the Ministry of Forestry or the Fire Service. The Ministry still has substantial expertise in its senior ranks; it is responsible for the working of the Forest and Rural Fires Act; and provides guidance to local fire authorities. But as an institution it does not fight fires and over time its expertise must decline.

The Fire Service has limited expertise in rural fires but it has the institutional framework within which this expertise can be developed. There are already good reasons why it should do so. The risk (confirmed by recent experience in Wellington and Christchurch) of vegetation fires within urban areas suggests that urban brigades and Fire Service officers should as a matter of course

receive some training in handling such fires.

Given this convergence, it does not seem sensible or economical to maintain two separate national authorities for urban and rural fires. Nor would such a separation assist the proper integration of Fire Service assistance and cooperation down the line, at regional and RFA level.

Initially it will be necessary to "buy in" the professional expertise needed in the rural Fire Division if it is to discharge its duties properly and have the respect of RFAs. Over time the career Fire Service should produce the trained specialists needed. One of the important benefits of the change should be that in due course all Fire Service officers will need to have experience and qualifications in rural firefighting if they are to advance beyond a certain level.

The national authority would be advised by a National Rural Fires Advisory Council. This council would have statutory standing and would consist of representatives of Ministry of Forestry, RFAs, regions, industry and public interest groups.

That is structure. Now finance. Our task has been to resolve the problems of equity and access. All who pay out for rural fire services, either by way of an insurance levy or through a special levy, must be assured that they will receive an acceptable level of service. The financial system must provide a mechanism to allow it to transfer money to users when required and it must be able to match limited resources to an unquantifiable and unpredictable cost.

The provision of rural fire services is community based and this is a sound principle to follow for funding. Organisations at each tier should be responsible for all of their operating, training and firefighting costs.

Extraordinary costs, above certain minimum excess levels, should be met from the Rural Firefighting Fund. The Fund is presently set at $500,000 but the conditions of access

have been so tightly set that so far only $102,000 has been spent. We are proposing that the Fund be opened up. The idea is that all firefighting costs, above certain minimum excess levels, should be met from the Fund.

Opening up the Fund in this manner will, we believe, provide a positive incentive for fires to be attacked with all necessary resources as early as possible. This will help ensure that small fires do not become large and expensive ones. An RFA will be able to attack a threatening or dangerous fire in the confident knowledge that the cost will be promptly met.
Opening up the Fund will also provide a strong inducement to RFAs to ensure that they maintain minimum levels of protection.

An RFA would be eligible for payments from the Fund only if it meets its statutory standards.

Where fires were started through negligence, arson or disregard of permit conditions, the national authority would take action to recover the costs, through the courts if necessary, and recycle the proceeds into the Fund.

The Fund would be financed as at present from the fire services levy and also from the proposed Section 60A levy on RFAs. This would be set at 50% from each source. We estimate that in the last five years $800,000 - $1.1M a year would have been paid out using these expanded criteria.

These are the main points of the recommendations. Our view is that they are best embodied in a new Forest and Rural Fires Act - even though much of the detail of the present one would be carried across.

Drafting a new Act will take time. It may not prove possible to have it drafted and passed before the start of the next fire season. In practice I think we may have to aim for the 1990 fire season. This has the advantage of giving time for the new local authorities to

settle into their responsibilities.

There are immediate steps that can be taken however.

We recommend that the rural division of the Fire Service be set up forthwith, to commence work on the standard-setting and other duties of the national authority; to work with the territorial authorities to ensure that the new system is established properly; and to help with the drafting of the new Act.

Protected Areas Legislation Review

W Devine*

Abstract

This paper describes the process of review of protected areas legislation. The response to an issues paper released for public comment is outlined. Basic proposals arising from the review are set out. The review will result in a new Act, consolidating the law relating to protected areas.

Introduction

The key Acts considered in the review were the Reserves Act 1977 and the National Parks Act 1980. The protected area provisions of the Wildlife Act 1953 and the Conservation Act 1987 were also included. It is assumed for the purposes of this paper that people are familiar with or know of the reason for this review.[1]

Review Process

The approach was to take the following steps -

- A ministerial working group was formed consisting of Department of Conservation officials, four advisors selected on their reputation as experts in fields related to protected areas, and the Executive Assistant of the then Minister of Conservation, Hon. Helen Clark. The group was responsible through the Department to the Minister.

- An issues paper was drafted for the Minister following consultation with individuals likely to reflect the different viewpoints of interested groups in the community.

- The issues paper was released for public submissions

*Department of Conservation, Wellington

- a response time of two months was allowed (to 30.8.88).

- Public forums were held at several centres around the country preceded or followed by "phone-in" opportunities. One meeting was held on a marae by request.

- Public submissions were analysed and the ministerial working group, in association with the Department, made strategy recommendations.

It is intended that legislation be introduced late in 1989 or 1990.

The review was a protracted process, initiated in late 1987 and is unlikely to be completed before 1990. However, that is put in perspective by one of the points made in the Department of Scientific and Industrial Research submission on the issues paper:

> "Rushed, ill-considered legislation could result in a statutory package which is less satisfactory than exists at present."

Response to Review

A total of 325 submissions were analysed. At least half were received after the due date and there was widespread concern about the early closure date. It was compounded by other Government reviews which were underway at the time. The submissions came from a wide range of interest groups and individuals, and were geographically well spread around the country. They included submissions from the New Zealand Federated Farmers, Otago High Country Section and the South Island High Country Committee.

Submissions tended mainly to respond to the specific questions addressed in the issues paper. The issue which received mention in the greatest number of submissions (68%) related to the future control of protected areas. Views were expressed about the respective roles of the Department, local Government and local boards.

Many submissions counselled that the review should not be zero-based but should build

on the experience and perspectives of existing legislation. Many gave support to the merits of the Reserves Act 1977, which had been proved in practice. Just a few submissions called for a more fundamental re-appraisal rather than an "adjustment to existing systems", which expressed the mood of the majority.

Related Legislation Reviews

The review under discussion was co-ordinated with other government reviews related to marine reserves, resource management, historic places, species, local government and marine animals.

Fundamental Principles

The review was guided by two fundamental principles related to protected areas:

- they maintain the indigenous and distinctive New Zealand character of our landscapes and provide for human use; and

- they are part of the public estate held and administered by the Government as trustee for all New Zealanders.

Basic Proposals

Reflecting the primary mood of submissions (for little change) the Minister has confirmed the basic objective of the review as set out in the 1987 Labour Party Policy. The emphasis will be on rationalization and simplification. Stemming from this, a single new Act will replace the Reserves Act, Marine Reserves Act 1971, and the protected area provision of the Conservation and Wildlife Acts. The National Parks Act will stand alone.

Classification

The Minister of Conservation has recently announced that his thinking at this stage is to reduce 20 classes of protected areas to four classes (and unclassified land) in the new Act. Provision for the protection of private land will also be brought forward. This change is fundamental to the original objective. How this would affect existing protected areas is illustrated in Tables 1 and 2.

High Country Concerns

Relevant issues that were raised in submissions concerned:

Access - there will be no new initiatives; the rights of land-owners are accepted. In respect to pastoral leases this matter will be considered as part of the Land Act review. At the same time the Department will continue to work with Federated Farmers on such schemes for public access as the New Zealand Walkways systems. In protecting land by voluntary agreements under the Protected Natural Areas Programme the Department will also be seeking to maximise the benefit of government expenditure by obtaining public access rights to protected areas wherever possible.

Cultural landscapes - the ministerial working group recognised their value, and the role farming plays in some of them. It did not consider, however, that they constituted a protected area class. Protected areas have a place in cultural landscapes but other mechanisms (such as district schemes under the Town and country Planning Act) are more relevant for fostering their protection.

Flexibility of legislation and management - is recognised as a desirable element in the new Act; suggestions from the seminar on detail would be welcomed.

Flexibility of covenants - will be pursued to the extent that protection of natural or historic resources is assured. Essentially the land-owner and the Department enter into a partnership over management - both have interests which they will seek to have protected.

Conclusion

The proposals outlined above are being considered by the Minister of Conservation (Hon. Philip Woollaston). It is considered that they will achieve the government's objectives of rationalization and simplification of protected areas legislation. Although no final decisions have been made and apart from re-classification, fundamental change of a radical nature is

not proposed as a result of this review.

Table 1: Protection Area Classification

New Category	Existing Category
Conservation Park	Conservation Park Reserves managed as a Maritime Park or Farm Park Watercourse Area (none established)
Reserve	Marine Reserve Scenic Reserve Nature Reserve Scientific Reserve
Historic Reserve	Recreation Reserve Wildlife Sanctuary Reserve Wildlife Management Reserve Wildlife Refuge Reserve Esplanade Reserve Faunistic Reserve Ecological Area Sanctuary Area
Wilderness Area	Wilderness Area
Local Purpose Area	Local Purpose Reserve (except esplanade)
Unclassified	Stewardship Area

Table 2: Protection of Private Land

New Provision	Existing Provision
Conservation Covenant	Conservation Covenant
Conservation Agreement	Protected Private Land Wildlife Refuge Wildlife Sanctuary Wildlife Management Area

---

1. For those not familiar with the review its purpose is set out in the Department of Conservation publication : Protected Areas Legislation : Issues for Public Comment. July, 1988.

The Conservation of Culture and Nature in New Zealand Mountains

Lance McCaskill Memorial Lecture 1989

Kevin F. O'Connor*

Lance McCaskill as I knew him was a very complex person. There were things about him that I liked and things that I feared. In the few years since his passing I hear praise and blame directed his way. Some people may be lending their ears today to have their views reinforced. "The evil that men do lives after them. The good is oft interred with their bones". Anyone with a sense of theatre will know as Mark Antony and William Shakespeare must have known that a half truth like that is bound to put one's hearers off the scent. And which half do I think is true? you ask. Half and half why surely! Half the evil and half the good and there is no settling which is which in our divided minds and memories.

I find Lance McCaskill's fiery presence never far away from some discussions in Lincoln and like places. They are usually discussions about erosion and its history and causes. It is as if McCaskill wrote large his name upon our souls as Ian Blair records L.W. McCaskill burned deep and large his name upon the timbered walls of Ivey!

I come not to bury McCaskill, nor to praise him. Lancecot McCaskill lacks not decent burial nor lacks he decent

*Professor of Range Management, Lincoln University

praise. When a man's life and work is honoured in a lectureship, it is perhaps fitting that the first lecture should be in the form of a tribute, as so eloquently made in 1987 by Kenneth Cumberland, friend, companion, colleague, contemporary, fellow soil conservator and conspirator with Lance in the impassioned 1940s.

A lecture series cannot persist in this vein. I believe it behoves me to focus our attention on some one or more of the areas of McCaskill's dominant passion or interest, to bring to that issue or topic my own understanding or opinion, and to touch it with something like that elemental blend of fire, wit, art and grace that will be forever McCaskill.

The topic of this address to honour Lancecot William McCaskill is "Conservation of Culture and Nature in New Zealand Mountains". It is a title close to his own: "Conservation of Natural and Human Resources" which he chose for the 4th Sydney Freeman Memorial Lecture to the Young Farmers' Clubs meeting in 1967.

My title is but a mountain scan of his larger view. For it was with mountains that I have been McCaskill's successor. I was not his contemporary as Cumberland was. I have never been his student, but I have often benefited from his instruction and sometimes even from his correction. It has not been my fate like some who toiled in his wake to find themselves sullied with the acrid airs of academic plot and counterplot. Nor has it been my joy, as for some others with whom he laboured, to have my praises hung aloft like so many banners displayed before the Registry. It was my simpler role to follow where he had trod, to marvel how such a small brave grown chief had worn such large moccasins.

Many will recognise how fitting a focus is this topic which I have chosen. As a founding teacher in rural education and extension, McCaskill had a special respect for the essence of

culture, for what we shall see as the way of life of a people at work on a land. As a founding and continuing teacher in natural history, McCaskill earned international fame and credit for his warm interpretation and passionate defence of nature. As first Director of the Tussock Grasslands and Mountain Lands Institute, he literally graduated to the eminence of the high country.

He never shed his interest in lowland swamp or forest.

He never made of mountains a consuming or dominating passion. I like to believe they gave him perspective and brought him a certain serenity. In culture, nature and mountains the many strands of his life were plaited together in conservation. In honestly and openly examining the issues, needs and prospects of conservation of culture and of nature in New Zealand mountains, then we may do honour to his memory.

Before I propound some of these issues, needs and prospects, I want to take care that no-one is under any misunderstanding. I am not ascribing to McCaskill any of my own insights, opinions or understandings. I want to put my ideas clearly and plainly enough so that you can match them with your own ideas. Debate them if you wish, but sort them out so that we can act on them. This is the lesson of McCaskill's teaching. Of course it claimed no infallibility, papal or scientific, or of any other sort. If it were matched with the input of other honest men and women, the outcome had the prospect of popular consent. Further, if it were not sicklied over with the pale cast of scholarly caution, it would not lose the name of action.

I have made it my business to enquire of many people who indicated that they had been taught by Lance McCaskill. None of them could recall a formal lesson from the classroom. Recollections were of ironic questioning to make use of observations, of field experience and field tuition.

Most of these recollections were not of new facts or theories learned, but of actions inspired, even of active changes to their own behaviour or attitude. I suspect that this is why many of us have been critical of McCaskill. He was perhaps too successful at winning hearts and minds, at stimulating and directing enthusiasm. If there be a failing here, is it not with those who declined to engage in that battle for hearts and minds? We can hardly complain of being unduly stirred to enthusiasm for this cause or that. We have been content with the sobriquet of the "passionless people". It is a sad commentary that one who would be welcomed as an animateur in one society is watched as a stirrer in our own!

Issues in Cultural Conservation

Let me explain what I mean by conservation, not just of nature but of culture. Conservation of nature or of culture is allowing the life forces in each to express themselves in going on being. I am aware that there are many in this audience who think that this alludes to them. They have had occasion before today to see themselves as endangered species and their way of life as threatened as any fragile ecosystem. It is true. I am concerned with the conservation of high country pastoral culture. I am also concerned with the conservation of the pastoral landscape which is now part of every New Zealander's heritage, fondly nourished as part of McCaskill's "Beautiful New Zealand" or "Unspoilt New Zealand". But this is not my only concern with conservation of culture.

It is a measure of how swift about us has been the tide of ideas, that in McCaskill's life time Ngai Tahu land rights had virtually no utterance in either pastoral or nature conservation circles. This makes some comment on the patience and perseverance of the Ngai Tahu, but it also prompts some thought on

persistent tunnel vision by some of us concerning the nature of Maori grievances. I belong to a generation that was brought up to believe Te Kooti a barbarous terrorist. I have found it difficult to think of him as a wonder-working saint and a prophet to his people. Devotees of British India had the same difficulty adjusting to Mahatma Gandhi. I am reminded that it was Te Kooti who warned Pakeha that if they neglected his grievance in his time they would have to listen to his grandchildren.

I am aware that the Ngai Tahu claim has now been heard at length before the Waitangi Tribunal and it is not for me to offer any judgements. I know that some people have felt threatened by the Ngai Tahu claim against the Crown. I believe that I can understand that feeling. I know from the spirit and letter of the law and the expositions of the Prime Minister and Minister of Justice that the purpose of the Tribunal and the Law under which it acts is not to right one set of wrongs by doing another. I take comfort also in the measured disavowal of any threat against any holder of land from the Crown, that has been made by Tipene O'Regan, as Chairman of the Ngai Tahu Trust Board. I have this trust because of the historic decision of the New Zealand Court of Appeal of June 29, 1987 which in the case between the New Zealand Maori Council and the Crown reached two major conclusions:

- the overriding importance of the principles of the Treaty of Waitangi,
- the requirements for Maori and Pakeha Treaty Partners to act towards each other reasonably and with the utmost good faith.

I am especially interested in this Treaty because it seems to me to make possible the conservation of Maori culture and of different forms of culture which are generated in New Zealand, such as a mountain pastoral culture and perhaps agroforestry in the future. I have to confess that I see the Treaty of Waitangi as the one agreement under

which the Maori and non-Maori people of New Zealand can have mutual respect and co-operation. I acknowledge that under the Treaty, the British Crown guaranteed to the Maori chiefs, tribes and people the full chieftanship of their lands, settlements and highly prized possessions. I also acknowledge, from reading Claudia Orange, that for nearly 140 years of the 150 odd years of this Treaty's existence, Maori people have complained that the non-Maori party was not honouring the Treaty.

I have learned enough about ties of people to land in different parts of the world to know that it is often much more than a matter of legal title or tenure. I accept that the traditional Maori relationship with land is much more than a question of chattels to be settled with a well trained lawyer. I believe that pastoral farmers and indeed farmers of all kinds recognize this kind of fact in their own relationship with land, especially when several generations have been involved. Just as the named mountain is the ancestor for any normal member of a hapu, so does a particular land become invested with the bones and spirit of our cultural ancestors. My respect for my own ancestors demands that I respect the ancestors of others, even if such others measure their honour to their ancestors in an entirely different way.

If I am to be concerned about the conservation of Maori culture in South Island, New Zealand, or Te Wai Poenamu, then I must learn to think of land in more ways than as the subject of the Land Act, in other ways than as "value of l a n d - e x c l u s i v e - o f - improvements", in other ways than as "steepland high country yellow brown earths", or "land uplifted high". Neither legal, nor commercial, nor technical designation will be sufficient, nor even the expression of wonder or admiration.

Just as this is true of conservation of Maori culture, so also is it true for conservation of pastoral culture. It isn't accidental or incidental that high country

runs or stations of the South Island have been invested with personalities. As Peter Newton observed, these personalities are evoked in some way by their given names, whether these be dubbed from the purple and green hills of Antrim, corrupted from misty Gaelic or Maori, or even transposed from the meagre imagination of a mortgage-holding banker. By naming and respecting names we affirm the bonds that tie us to land. As I have been fond of reminding students for the last twenty years, culture is "the impact of work on environment by a people acting under the impulse of a continuing tradition". I quote the phrase for it is not my own, but Christopher Dawson's, author of "The Making of Europe". I believe he was writing about landscape genesis and social anthropology some time before such subjects were speciated within the historian's repertoire. It is interesting for us to realise too, that nearly all those highly prized forests of Europe are the recreative work of human culture, often dateable from the 11th, 14th or 15th century.

Every culture has the right to its own history. Every culture has the need to retell its own myths. A plural society must provide for its history to be braided from all its strands. If we could accept the plurality of history we might not provoke so many bloody insurrections or feel compelled so brutally to suppress them.

If we are to have culture conservation, then people have to continue working on their environment under the impulse of a continuing tradition. Continuing work demands a continuing tradition, but it does not imply slavishly mimicking our grandparents. Some of the very human aspects of human behaviour are its adaptive, learning, creative characters. Continuing culture also requires a continuing environment. A considerable amount of human adaptation and ingenuity is applied to ensure that the environment is resilient to the work impact. There could be no possible cultural conservation for a

pastoralism that destroyed its resource base, just as there was no continuing conservation for a moa-hunter culture in early Polynesian occupation of what became New Zealand. The loss of the resource base was not just the loss of moa. It was also the loss of forests on which the moa depended. The outcome was a reduced area of different forest, without moa and without moa-hunter.

What we have to understand as in some ways culturally European New Zealanders is the ties that bind us. There are ties that bind Maori to particular lands and ties that bind farming people to land. There are even ties that bind recreational people to particular kinds or tracts of land. These involve issues which we cannot comprehend, let alone resolve, if we always express them in the conventional terminology of our European-derived legalistic tradition: secure tenure, rights to renewal of lease, lessor's and lessee's rights, landlord and tenant, property rights and the like.

I have considerable respect for the institution of private property on primary or a priori grounds as a basis for human welfare. (In this respect I am consistent with the scholastic philosophy and the social teaching of Pope Leo XIII which I value as part of my early formation). I also accept that the conventions of private property and stability of possession make for peace, harmony and prosperity in a society, so long as all members of a society have equitable opportunity to acquire such property and enjoy rights concerning it. I find no justification for the abolition of private property in the abuse of power which some may exercise through it. Having made it clear that I am neither communist nor socialist, and realist rather than idealist, I can also state that I applaud the eagerness with which Rodney Hide and Peter Ackroyd have recently canvassed the "property rights" pathway to expound the freehold option for high country land tenure at the Annual Conference of the High Country Section of Federated Farmers 1989.

Persuasive as their argument may seem, I recognise it as an argument about rights that is couched in the legalist conventions of our culture. So there are three points that I wish to add for the record:

- That there are peoples and cultures who do not share in the same way the legalistic conventions of our culture;
- That there are other important elements in our European culture which are not codified in statutory law about property or even in common law;
- That these other cultural elements of our European tradition are especially concerned with our responsibilities to our neighbour, whether or not he or she owns property, and with our responsibilities towards land and to other beneficiaries and users of it elsewhere and to come.

It would be naive to think that market forces exercised among holders of property rights could be a sufficient guide to the future of New Zealand, even if there were no Maori. Seeking freedom from constraint for a market to function is not however tantamount to an abdication of moral responsibility. There is some virtue in having laws to regulate human behaviour rather than having them attempt to regulate markets. I am also aware that farmers and perhaps high country farmers in particular, are conscious of their own belonging to land and of the obligations that flow from that. This is what I have elsewhere called "landship". It has imbued in it a profound sense of place. It is an ancient cultural concept as true in any of your cultural traditions or McCaskill's or mine, as is turangawaewae in Maoridom. It is not enshrined in law, even though (as McCaskill noted) William Lowdermilk had been tempted to formulate part of it as an 11th commandment in the Mosaic Law. For the modern environmentalist, Aldo Leopold has a special role in its rediscovery and articulation as a Land Ethic, in Sand County Almanac.

In positive law, as we know it, we have land belonging to us. In our cultural roots we also belong to land. Statutory law is inadequate for expressing the essentially two way nature of the relationship between the farmer and the land he farms, or for that matter between me and the land which I serve. We should be grateful to the Ngai Tahu and to the whole Maori renaissance for the stirring of our own cultural roots. The conservation of pastoral culture and the conservation of Maori culture can nourish one another by respect for the land and for one another.

Lance McCaskill articulated respect for the land in the best tradition of the forefathers of modern conservation, and expressed it in a way which any culture might grasp and make its own. In his Freeman Memorial Address of 1967 he said: "The primary social adjustment is the adjustment of society to the land. Upon the soundness and stability of this basic relationship depend the harmony and security of all the relationships within the social order. For national survival we must retain and develop an enlightened rural people who find satisfaction in their way of life, are proud of their calling, are wise rather than clever, are industrious and efficient, and whose creed is to cherish the soil and husband its resources".

McCaskill as Conservator of Nature in the Mountains.

A few moments ago I mentioned McCaskill's allusion to the 11th or Conservation Commandment as formulated by W.C. Lowdermilk from his experience in Mediterranean countries in 1939. It is worth repeating for its inspiration of McCaskill. Lowdermilk proposed that a Moses with greater foresight "would have been inspired to deliver an Eleventh Commandment to complete the trinity of man's responsibilities to his Creator, to his fellow men and to Mother Earth. Such a Commandment should read somewhat as follows:

"Thou shalt inherit the holy earth as a steward conserving its resources and productivity from generation to generation. Thou shalt safeguard thy fields from soil erosion, thy living waters from drying up, thy forests from desolation, and protect thy hills from overgrazing by thy herds, that thy descendants may have abundance forever. If any shall fail in this stewardship of the land, thy fruitful fields shall become sterile stony ground or wasting gullies and thy descendants shall decrease and live in poverty or perish from off the face of the Earth."

We recognise this as good inspirational stuff. It is not very good interpretation of Mediterranean and Middle Eastern geography, and its demographic predictions are not the best, but there is very little harm and considerable good comes from exhorting people to safeguard their fields from soil erosion, their hills from overgrazing and their forests from desolation.

I have been interested to discern where and why Lance McCaskill learned this scripture. I believe that many people have already attended to his interest in nature conservation, especially what we refer to as biological conservation. What were the origins of his interest in soil conservation? When he visited the United States in 1939 it was as Lecturer in Agriculture at Christchurch Teachers' College. He went with the avowed special interest of studying the role of field visits in teaching conservation in agricultural education and in natural history education. It was this bent which brought him in touch with the National Parks Service and with the Soil Conservation Service then flourishing as a vigorous and messianic offspring of a Roosevelt New Deal and a series of catastrophic dust storms and soil loss events in the central and south eastern states. There are therefore two streams of interest in these visits, one in natural history and its interpretation, the other in soil conservation. They each had a source.

McCaskill's field skills in natural history derived from his intense interest in biology,

as well as agriculture and horticulture, as a teacher and instructor in high schools and teachers' colleges in several parts of the country in the 1920s and 1930s. His active involvement in nature conservation projects on the ground are numerous and I have not been able to trace more than a fraction of them. Several of them are familiar to us as the development of alpine gardens at Arthur's Pass both at the settlement and at the Railway Station, the fencing, weeding, transplanting and "gin-watering" of the Castle Hill buttercup for years before it caught the tide of village development, land exchange and a place in our conservation pride. Then there was the struggle to get T.H.C. hotels in National Parks to use park flora in their own landscapes. Notice that every one of these items was an exercise in action. In work for each Lance McCaskill led by example.

Most celebrated of all was the battle of the tarns, not simply the saving of a charm of timber-line nature which all could see and soon could walk through, but a fiercely fought battle against the wee mon's most sought out enemies, cant, hypocrisy, deviousness, double-dealing, mushroom management. These were times when even his friends grew fearful. I often wondered what the lovely lady Isobel felt at the wounds and pain he bore. These particular interests and his involvement in Forest and Bird, Arthur's Pass Park Board and local issues like Riccarton Bush and Kennedy's Bush, light the way to the nature conservation radiance that came from his exposure to the US National Parks Service, his membership in his own right as a Friend of the International Union for Conservation of Nature, his appointment to represent National Park Boards on the new National Parks Authority, and his subsequent national and international honouring as Nature Conservationist. We all now know how his retirement itself became a renewal, and that his greatest period of interpretative writing for scenic reserves, national parks, and natural landscape

was that which followed his shedding of office.

The origins of the Soil Conservation Connection

I have also tried to discern some pathway into the thirties that would lead to McCaskill's exposure in the United States to what was soon to pervade the world as the "Soil Conservation Movement". In McCaskill's own historical account of the growth of this movement in New Zealand, he identifies several of the early expressed concerns of deforestation in New Zealand and its supposed consequences in flooding, of Walsh's now famous non-co-evolutionary premise for deer damage in New Zealand forests, of Henderson and Ongley's 1914-1916 post-storm visit, (a precursor to Bola) in the Puketiti district of East Coast. These and other warnings of scientists in the 1930s soon were dwarfed by the February storm of Gisborne and the April storm of Hawke's Bay in 1938, a year before McCaskill's Carnegie tour of the United States of America.

This account by McCaskill is valuable for identifying the currents that moved people, for the incidents that probably affected the interpretations and the decision-makings that led to New Zealand organisational change. What it is not so good for on its own, is as a critical examination of the wisdom of each step that was taken, of each summary judgement that was made about the nature of the problem. That is often the stuff of which current land and water resources management science is made and we have the example of the work of John Hayward, George Griffiths, Andy Pearce, Colin O'Loughlin, Ian Whitehouse, Morrie McSaveney, Pat Grant and Phil Tonkin to name but a few in this field. Both story-telling and story-testing are essential steps for avoiding repeating grandparents' mistakes, while continuing their cultural tradition.

There is also another deficiency in this account by McCaskill. It does not do much to reveal the origins of McCaskill's own involvement

in soil understanding or soil care. But there is a clue in McCaskill's largely self-effacing history. In "Hold this land". p.21, he writes:

"McCaskill, a graduate in agriculture from Lincoln College and Lecturer at Dunedin Training College, had become interested in soil erosion when acting as secretary of a committee of the Otago Royal Society which was in 1929 investigating the damage done by deer to forests in the back country of Otago. His copy of "Soil Erosion, a National Menace" by H.H. Bennett and W.R. Chapline (1928) showed him that deer damage was producing typical soil erosion; and further that most of the types of soil erosion described by Bennett were active in New Zealand."

The date of this Otago involvement is significant. In 1929 L.W. McCaskill also completed his Master of Agricultural Science thesis in the Department of Agricultural Economics of Lincoln College. In 1928-29 he had been a part-time student at Otago University. His thesis earned him first class honours. Its title: Fertilisers in New Zealand. His thesis is a motherlode in the understanding of McCaskill concern for natural resources and for sustaining culture. He traces the youthful history of the world fertiliser trade, the imports of various fertiliser materials from various sources into New Zealand ports from 1867, pointing incidentally to the initiating role of Ivey of Lincoln with his own superphosphate imported from 1880 and the stimulus to basic superphosphate from R.E. Alexander from 1910. He outlined the history of New Zealand fertiliser production and fertiliser use, the beginnings of A and P Society and Lincoln College sponsorship of trials, the formalisation of fertiliser experimental work in the Department of Agriculture under A.H. Cockayne and A.W. Hudson from 1924.

He collated interview reports, included from Canterbury Agricultural College, Cawthron Institute, Department of Agriculture

(for several districts) and the youthful Massey College. These represent another mine of understanding of the birth of a new restorative phase of pastoral culture. The major regions of the country were each analysed for practice, response and fertiliser opportunity, so that the wise young McCaskill could advance some very realistic conclusions, even though he noted that it was dangerous to prophesy. Among the predictions which he made 60 years ago, I select five for attention now:

"*1.) Topdressing with phosphates will continue to be of major importance. At present only 13 per cent of the sown grasslands are treated, but there are six million acres where it is considered payable increases can be secured*".
"*3.) The use of raw rock phosphate that makes a culture of the Tunisian type will continue to increase*".
"*5.) Utilisation of the increased growth will become more and more a subject worthy of intensive study*".
"*7.) The application of fertilisers will enable land at present beyond the margin of cultivation to be brought to production and the reversion of much second class land will similarly be checked*".
"*10.) Farmers will depend more and more on scientific investigation to solve the problems of soil fertility*".

While I have not quoted you all of his conclusions, what I have cited is enough to show McCaskill with a thorough, earthy and practical understanding of the gutsy issues of price, fertiliser quality and marginal lands that have plagued us as a pastoral farming culture ever since we cleared the bush.
I suggest that here, at the brink of the great economic depression, we can recognise in a young man a level of soil and agricultural understanding somewhat ahead of his time. The frustration which so affected McCaskill in his middle years may well have its origins in his early awareness of soil's need for care and nourishment, a need which was not to be met for hill lands for another 20 years. McCaskill "Soil conservator"

is originally McCaskill "Carer for soil fertility".

We should remember these beginnings because they offer an insight into another aspect of McCaskill: technical concern with the cultural development of grasslands, something which still has to come to terms with nature conservation. It may be noted that his care for soil fertility was prior to his catchment orientation of soil conservation.

I have suggested elsewhere that it was Cumberland who should be most credited with attributing to man the primary causation of so much of our erosion. I also believe it was McCaskill who stitched in the connection between upstream catchment condition and downstream flood behaviour. That connections of this kind are simple, plausible and very often wrong, was not to be suspected by McCaskill who had been shown documented evidence of the connection in the United States. I can't blame him for using the likes of the Canterbury Progress League to persuade Hon. Bob Semple and his fellow parliamentarians to link "Soil Conservation" and "River Control" into single regional bodies organised on the basis of catchments. I can, however, upbraid my fellow scientists and the institutions which funded them for the inordinate delay before McCaskill's plausible connection was ever subjected to a genuine falsification test. And I am proud of John Hayward as one of McCaskill's devoted followers that he led the way in that falsification process.

The Current Issues of Nature Conservation in the Mountains

The testing of plausible connections has some bearing on the issues of nature conservation which have to be reconciled with cultural conservation. As I have indicated earlier, conservation *sensu stricto* allows the forces in nature or in culture to express themselves without constraint from without. Unless a culture has within it forces sufficient to ensure the maintenance of its resource

base, then by definition, it is not sustainable. It is a moot point to assess how much nature conservation is essential for the maintenance of a resource base that makes a culture sustainable. That is the nature conservation minimum for culture conservation. Regardless of what is that bottom line, where are set the limits to acceptable change, land use planning is one of the ordinary ways in which nature conservation is reconciled spatially with cultural conservation, including the conservation of pastoral culture to which McCaskill was himself committed.

McCaskill was seldom if ever involved in the formal business of science. He never considered himself a scientist. He always sought interpretation and advice about the significance of particular findings before he used them, even in the field. When I was in Grasslands Division DSIR at Lincoln in 1963, he had me spend hours with him examining the recent scientific record for him to write a "Review of Advances in Tussock Grassland". Only when he was satisfied that he had grasped all aspects of a topic could he make his own judgment as to whether it mattered for the review in hand. He presented this to Grasslands Association at New Plymouth. In his opening he cited a statement that was made at the 1950 Grassland Association Conference, held at Invercargill:

"to New Zealand as a whole the tussock grasslands are of value for one purpose only, that is the feeding of livestock."

McCaskill noted that that statement had gone unchallenged. "I think" he said in 1963, "most people would now agree on the importance of the tussock grasslands from the point of view of soil and water conservation, of their value in regulating stream-flow for stock water on the plains, for the generation of hydro-electricity and irrigation."

McCaskill's appeal to such a popular poll some 26 years on in 1989 would probably have some mixed results.

Certainly the significance of pastorally-used tussock grasslands for water supply for hydro-electricity generation in New Zealand has been discredited for all except small storages and stations like Mahinerangi and Waipori. The debate that has raged about hydrological influences of snow tussocks during the last couple of years would likewise indicate that most people would not now agree on their value in regulating stream flow or on their importance in water conservation. I don't attempt to resolve this issue as a value, as an instrumental purpose of nature conservation of a particular kind. I just want to point out that attitudes and values change. Nature conservation which is pursued for the sake of some particular value is vulnerable to change in that value.

Nor is this change all in any one direction. In 1963 McCaskill did not identify or assert any intrinsic value or non-instrumental value for tussock grasslands as such. I am not saying he denied them. I merely want to remind you that he did not make such values explicit either in that document or elsewhere. Each one of us has to find one's own values. In the early 1960s I had proposed for the support of my Grasslands Division Director, Dr P.D. Sears, a scientific concern with what I then called Protection Grasslands, by analogy with Protection Forests. In the mid 1970s I found myself learning and teaching Nature Conservation for this is what I believed McCaskill before me would then be doing for the students we now had in Parks and Recreation courses as well as in Resource Management. I had international as well as national concern for Nature Conservation, especially in mountains and in grasslands. By this time I was expounding "Biological Conservation" or "Nature Conservation", as a use of land, assessable in its own right. For my own part, I declined to join the Forest and Bird Society unless it made Nature Conservation of tussock grasslands and related systems an integral part of its aims and objectives. This was

not because of any lack of concern for forests but because of my real concern for neglected grasslands and the like.

Now I have to confess that the whole rush of identifying this item and that as "possessing intrinsic value which demands" its preservation under Conservation Act, Reserves Act or some other program, appears like a combined outbreak of hives and shingles: very debilitating, symptomatic of something else, and not very amenable to comprehensive treatment. I do not deny the possibility of "intrinsic values", although like some philosophers who have examined the topic (e.g. Callicott, 1986), I am inclined to the view that intrinsic values are located in Topic the species, the essential value of biological diversity. I believe that "ascribed values" are much more clearly demonstrable even though they may be reducible to the "utilitarian" or "instrumental". These values are, of course, conveniently represented by some to be intrinsic. I believe the identification, estimation and respecting of values ascribed by different parties in society is a proper topic for social commerce. I have advocated and promoted that kind of conduct in an open and mutually respectful way for more than 20 years. I see it as an essential feature of what some may see as participative planning, the social and political essential core of land use planning in a democracy. A clear articulation of the status of protective uses such as biological conservation in such a goal reconciliation or planning process in New Zealand mountains has been asserted for more than a decade (O'Connor, 1978). It is worth noting that it was accepted and confirmed in official government policy (New Zealand Government, 1979) but has languished since, like many other elements of that same high mountains policy.

Rather than hand out demerits for failings in nature conservation or policy implementation in other ways, I would like to lay emphasis

on some of the positive features that occur, whether consistently or from time to time. I suspect that New Zealand has been indulging in so much self criticism that it can benefit from finding some good points.

I believe that the same principles of behaviour that were enjoined on the parties to the Treaty dispute by the New Zealand Court of Appeal are very appropriate. "The parties in the dispute should act towards each other reasonably and with utmost good faith". This sort of behaviour has not been consistent in nature conservation vs. pastoral use disputes but it has often been demonstrated. We should conform to those principles of behaviour no matter which side of an argument we are on, bearing also in mind that in land use issues there are very seldom only two parties.

It appears to me that there is general agreement with the spirit of the vital clause in the objects of the Reserves Act of 1977:

"Preservation of representative samples of all classes of natural ecosystems and landscapes which in the aggregate originally gave New Zealand its own recognisable character".

While this object may have general support and agreement, there is not general support and agreement for every kind of ecosystem in every ecologic district being identified as a priority for preservation. Nor is there widespread agreement on the role of the state in securing protected status or in putting the preservation into effect. This suggests that there is some agreement about ends but not about means. Pastoral farmers should not delude themselves in this matter. They may pride themselves on conserving the tussock grasslands thus far, but they should acknowledge that their pastoral development for the sustainability of their culture puts the lower altitude tussock grasslands and wetlands, especially the short tussock grasslands, at risk (Scott, 1979; O'Connor, 1982, 1987). It is

unreasonable to expect nature conservators to be satisfied with a simple "Trust me. Leave it to me!" Likewise it seems to me that it is unreasonable to have development moratoria continued sine die unless there is utmost good faith in completing PNA surveys and coming to negotiated decisions about effectuation.

These seem to me the kind of issues which should be faced in what we might call a Waitangi spirit of reasonableness and utmost good faith. Without such an approach we will never understand what another party is trying to tell us, why that party ascribes value to that feature, or taxon, or taonga.

There is even more to the metaphor of the Treaty from which we can learn. I have earlier alluded to the difficulties of dealing with the values of two cultures through the legalistic medium of one, when the wider dimensions of each culture need to be kept in view. A similar problem occurs among the protagonists of quite different uses of the one resource. In a sense they represent different cultures, or subcultures, each with their own sets of statutes, but each having a dimension beyond what is codified in law. Having two subcultures - pastoral farming and nature conservation - battle it out in adversarial encounter with Land Act and Property Act in the armoury of one, and Conservation Act and Reserves Act as the weapons of the other, makes for an interesting gladiatorial spectacle, and little more. We might think that this is what Courts and Tribunals are for, to settle issues according to law. Again I would put it to you that there are elements within each party's culture which may appear in but are not confined by statute, notions like rangitiratanga which are vital ideas to one culture and untranslatable to the other. By analogy, try "ecosystems" or "landscape", or "pasturage". For this reason I lack confidence in the force of law on its own, just as I lack trust in the force of arms, however righteously employed. For more than a decade now I

have pleaded that we should leave aside the swift recourse to statute and to administrative power and settle down to some genuine transactional planning. As Pat Devlin and I have suggested (Devlin and O'Connor, 1989), this seems to be essential for nature conservation to be assured in the midst of recreational impact, even within Conservation Land. How much more necessary is it when more varied use interests are involved. Note that this kind of opportunity spectrum planning demands that either limits to acceptable change be defined or some other goal constraint specified. I believe that the advent of regional resource management makes such an attitude change not only timely but imperative.

So far as land use planning in general in the mountains is concerned, we can first agree without further dissent that there are several kinds of goals or objectives to be sought: pastoral production in different forms, forest uses of different kinds, nature conservation in different ways, heritage conservation, recreation of different kinds, landscape conservation, creation, and enjoyment. Sometimes, pursuit of one will compete with others. Sometimes they will work together synergistically. Sometimes, for example, nature conservation will require the exclusion of other uses from a particular land tract. Sometimes it will accommodate other uses. Sometimes it will require another use alongside to ensure that it remains viable.

Second, I can assert as a proven principle of land use planning that the suitability of a particular tract of land for one particular use may influence but does not predetermine its use in that way. There needs to be a need. Such a force as effective demand must exist for a market to function. Sometimes this means more than hollering. It requires us to show the colour of our money, even for nature conservation. The genuinely discerned intrinsic value to which I have earlier alluded, or that "bottom line" of nature

conservation which ensures the sustainability of a culture, may set the equivalent of a safe minimum standard (SMS) for species and habitats. Beyond that we may have to resort to benefit cost analysis (BCA) for further ascribed nature conservation values (Randall, 1986). It may be difficult to quantify the benefit-cost ratio of nature conservation projects but we should not assume that the benefits are immeasurably high, or that they are ridiculously small in relation to opportunity costs.

We can consider as a third working principle that having a wide gamut of possible uses gives no warranty that room for all possible uses will be found everywhere. This principle can have some harsh expression. A corollary is that no special rights attach to existing uses, everywhere. In other words, a change of use may be wise in some situations. It is in such situations that provisions for compensation are warranted in the interest of the public good.

Fourth, we can recognise that designating particular objectives as the responsibility of particular bodies or organisations is a fairly effective way of getting the debate among objectives clarified, but it won't necessarily get any decisions carried out on the ground. Conservation and different kinds of development have to be integrated on the ground. They do not always have to be pursued as common uses of the one tract of land. Sometimes they need to be separated, sometimes even buffered one from another. The essence of the integration of conservation and development on the ground seems to be that nothing can be planned independently, that everyone has neighbours.

Fifth, we can acknowledge that providing for the solution of problems by issuance of new categories, credit cards, statutes or cheque books, or even by calling in the militia, will not necessarily be effective if some party remains aggrieved. These are devices for putting agreement into effect, not for arriving at an

agreement with no abiding grievance. We should recall that the Ngai Tahu have waited aggrieved for 140 years, and more, that it is more than 100 years since their ancestors were escorted out of Omarama by the constabulary. I don't think that they have any monopoly of patience or persistence. We have to learn to make fair settlements, not simply to exercise superior power, whoever we are who hold it.

Let me cease from this listing of principles of land use planning and their implications for us. I would rather nominate some of the ways in which we can learn to listen, talk and act together, for the sake of conserving nature in various ways, as well as to ensure the continuity of sustainable culture. I put these topics in order of solubility, with the more readily soluble first. I believe that parties can get to know one another better by listening, talking and dealing with easier problems first. That can build trust for the harder issues later. I suggest that these topics can be discussed on a similar basis for several districts but I do not expect all districts to find the topics equally easy, nor do I expect similar solutions to be proposed everywhere.

Topic 1. There is a great area of high altitude country which requires little if any change from its present minimal management for it to continue to provide the nature conservation, landscape conservation, wild land recreational uses as at present, along with minor but perhaps vital pastoral uses. The parties concerned need to identify the values provided, those that are threatened, those that are assured, those that are in doubt and may require monitoring under varied regimes. This kind of country will also need generous and careful planning of access.

Topic 2. There is an even larger area of tall tussock grasslands in various degrees of modification, much of it tending now towards shrubland of different kinds. Catchment authority personnel have identified the need for

fire policies for such terrain to be clarified. Again the parties concerned need to identify the values provided under current management regimes, those that are threatened, those that are assured, and those in some doubt and requiring monitoring under varied management regimes.

Topic 3. All grasslands below timberline are subject to invasion by woody plants, especially conifers and broom. Values threatened are pastoral, landscape conservation and nature conservation. Parties concerned need to identify values and assess the management regimes that reduce or aggravate the threat on different kinds of terrain. This would lead to agreed plans of control or prevention, or agreed zones for forestry uses.

Topic 4. Grasslands in the drier zones are most severely affected by past grazing and are at present most threatened by rabbits. Values affected are of nature conservation as well as pastoral use. Rabbit population control is a pre-condition for any other kind of use. Joint action for rabbit control and land use planning is an acknowledged necessity, but the role of different parties remains uncertain.

Topic 5. Grasslands, wetlands and shrublands that are to be dedicated for particular nature conservation purposes will require management prescription for themselves, as well as for their boundaries or surroundings. Such management prescriptions may have to be, at the outset, tentative or experimental and subject to monitoring and evaluation. Parties to such management agreements have to settle such matters as who prescribes the management, who supplies the management components? at whose cost? and for what partition of benefits? The components of management may include fire prevention or use, grazing exclusion or use, rabbit destruction or exclusion, conifer eradication or prevention, recreational or educational use.

There are many technical or scientific issues with which I might interest you or vex you. I believe that they can be acknowledged, like the legal issues, as important and worthy of care and study. I have concentrated on topics and approaches which can come from socially shared field experiences and exchanges. I believe this is what McCaskill would prescribe for the present circumstances. He might also insist that you can't go home until you've turned in an agreed-on solution to your assignment!

References

Bennett, H.H., Chapline, W.R. 1928. "Soil Erosion: a National Menace". United States Government Printing Office.

Callicott, J.B. 1988. On the intrinsic value of non-human species pp.138-172, In Norton, G.B. (Ed.) The Preservation of Species: The Value of Biological Diversity. 305pp. (first published 1986)

Devlin, P.J. and O'Connor, K.F. 1989. Exploring relationships of recreation users, impacts and management. pp.178-187. In Proceedings of the Workshop on Environmental Monitoring. Dunedin.

McCaskill, L.W. 1929. M.Agr.Sc. Thesis. Fertilisers in New Zealand, Lincoln College, University of New Zealand.

McCaskill, L.W. 1963. Review of advances in tussock grassland. *Proceedings of Conference. New Zealand Grasslands Association,* New Plymouth.

McCaskill, L.W. 1973. "Hold this land. A history of Soil Conservation in New Zealand." A.H. and A.W. Reed, Wellington.

New Zealand Government. 1979. High Mountains Policy. Department of Lands and Survey, Wellington, New Zealand.

Norton, B.G. (Ed.) 1988. The Preservation of Species: The Value of Biological Diversity. 305pp. Princeton University Press, Princeton, N.J. (first published 1986).

O'Connor, K.F. 1978. Planning for the integration of uses in the New Zealand high mountains. pp.103-115. In. Proceedings of the Conference on Conditions of High Mountain Resources, November, 1977. Department of Lands and Survey, Wellington.

O'Connor, K.F. 1982. The implications of past exploitation and current developments in the conservation of South Island tussock grasslands. New Zealand Journal of Ecology 5: 97-107.

O'Connor, K.F. 1987. The sustainability of pastoralism. pp.161-188. In. Proceedings of the 1987 Hill and High Country Seminar. Tussock Grasslands and Mountain Lands Institute Special Publication No. 30.

Orange, C. 1986 : The Treaty of Waitangi. Allen and Unwin.

Randall, A. 1988. Human Preferences, Economics and the Preservation of Species. pp.79-111, In Norton, B.G. (Ed.). The Preservation of Species: The Value of Biological Diversity. 305pp. Princeton University Press, Princeton, N.J. (first published 1986).

Scott, D. 1979. Use and conservation of New Zealand native grasslands in 2079. *New Zealand Journal of Ecology* 2:71-75.

Gene Manipulation

D. W. Bullock*

Developments in molecular biology over the past 20-odd years have made it possible to isolate individual genes, to manipulate them in a test-tube, and to transfer genes to a plant or animal where they did not exist before. This ability has far-reaching implications for animal production, allowing not only improvements in desirable characteristics but creating entirely new ways of farming. Genes are the units of heredity. With the techniques of molecular biology we can thus manipulate how genetic traits function and how they are passed on from one generation to the next.

Genes are made of a chemical, called DNA, which can be isolated in pure form. Once isolated, we can do two things with a gene of practical use in agriculture; we can label it and use it as a probe to locate that gene in DNA from another animal, and we can transfer it into an animal where it is not normally present and have it function like all the animal's own genes. An animal (or plant) into which a foreign gene has been transferred is called transgenic.

This technology offers hitherto undreamed of possibilities in agriculture (Figure 1). Using labelled DNA as a probe, we can analyse DNA from any animal to find out whether a particular gene is present. This kind of DNA analysis permits us to find the locus of a particular genetic trait, on which chromosome and

*Professor of Biochemistry, Lincoln University

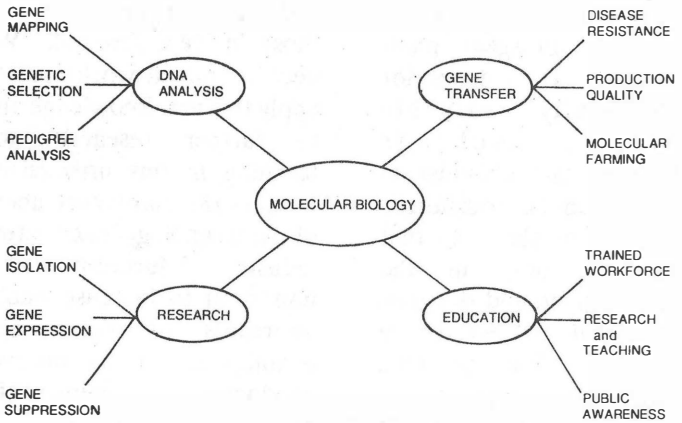


Figure 1: Application of molecular biology in agriculture. See text for discussion.

where along the length of the chromosome a gene occurs, through a process called gene mapping. Using DNA analysis, we can determine, at birth if desired, whether any one animal carries a particular gene of interest. This genetic selection at the DNA level can be carried out in animal breeding programmes, with consequent advantages in terms of time and cost-savings through early culling, obviating the need for lengthy and laborious progeny testing to see if a desired trait is present. Finally, DNA analysis can be used to establish unequivocally the parentage of a given animal, allowing precise pedigree analysis in breeding programmes.

Gene transfer opens up the possibility of producing new lines with disease resistance or with improved production quality, for example in weight

gain, feed efficiency, fleece weight, carcass composition, etc. We can arrange for the transferred gene to be expressed only in a particular tissue of the transgenic plant or animal. Thus genes for commercially valuable proteins, such as pharmaceuticals or industrial enzymes, can be transferred into a cow or sheep so that they work only in the mammary gland and the gene product will be secreted in the milk. The product, perhaps a drug important in human or veterinary medicine, would be extracted from the milk, adding a new post-farm process with attendant new investment and new jobs. In this way, farmers could be given the choice of raising animals not for food and food products, but as biological factories making a valuable commodity. This approach has been called molecular farming and offers the potential of a higher profit margin than the traditionally low profit margin associated with primary production.

Figure 1 also indicates that molecular biology has important ramifications in research and education. Molecular biology is no good without molecular biologists and there are precious few of those in New Zealand. We need a trained workforce to apply this new knowledge and to further research and teaching in our universities to meet the manpower needs of the technology-based future industry. Education is also important to increase public awareness of these new techniques. It is no use producing a genetically manipulated animal if no-one will eat its meat or drink its milk. Along with increased awareness and understanding will come public acceptance of the benefits to be derived from applying molecular biology on the farm, and a lessening of the public fears of this new technology, which have been fanned into needless proportions.

Further research will go hand-in-hand with commercial exploitation of molecular biology. The sixty-four-thousand dollar question in gene manipulation at present is which gene to manipulate.

Despite all the agricultural research that has been done, we are mostly in the dark about the genetic basis of production traits and disease processes important in the animal industry. Gene isolation procedures will allow us to identify new genes even before we know what the gene does in the animal. We need more understanding of gene expression for better control Research is now leading to ways of gene suppression, of how the transferred gene works in its new environment which will be valuable in removing undesirable traits or correcting genetic errors, already at the experimental stage of human medicine.

Finally, the impact of gene manipulation on the processing, marketing and economic aspects of the industry has to be considered. Molecular biology does not stop at the laboratory bench; it has broad ramifications into all parts of the business and social spectrum of agriculture.

Seen under an electron microscope, magnified about 18,000 times, a piece of DNA looks like beads on a string (Figure 2).

An isolated gene like this is what we can label and use as a probe, or transfer into another cell or animal.

DNA Analysis

We can cut up pieces of DNA like the one shown in Figure 2 using special enzymes, called restriction enzymes. These enzymes come from bacteria and about 300 of them are available commercially. Each enzyme cuts DNA at its own target site. A particular gene might have, say, 3 target sites for a particular enzyme (Figure 3). This enzyme will cut this gene into 2 fragments, one longer (A) than the other (B). The DNA fragments can subsequently be separated according to their length and detected using a DNA probe. In another animal, this gene may have mutated so that it has lost one of the target sites for this enzyme. Cutting DNA from that animal will produce only one large fragment (C; Figure 3).

Because the cut fragments were made by restriction

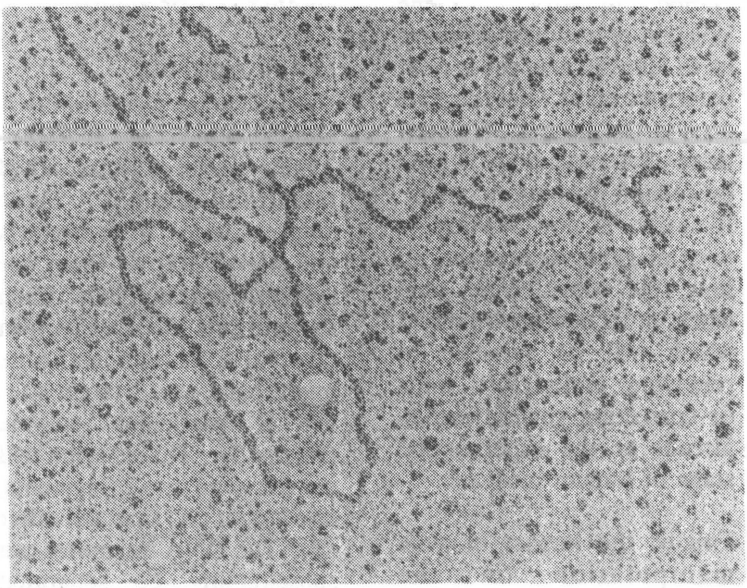


Figure 2: A fragment of DNA viewed under an electron microscope and magnified about 18,000 times.

enzymes, they are called restriction fragments and in this example the gene differs in different animals for this enzyme's target sites in the DNA; it is said to be polymorphic. The polymorphism produces different restriction fragment lengths so it is called a restriction fragment length polymorphism, or RFLP.

RFLPs form the basis for DNA analysis. Figure 4 shows the pattern of RFLPs in two

sets of parents and one of each of their offspring, who are bred to produce a second generation. In the first parents, the mother has fragments CD and the father fragments AB of a four-fragment polymorphism. Their daughter gets one gene from the mother and one from the father, so is, say, AD. In the second parents, the mother is AC and the father has only one fragment (BB); their son is thus BC. In the second generation, half the offspring (regardless of sex) have the pattern AB, one quarter has BD and the remaining quarter is CD. Thus the inheritance of this RFLP follows the ordinary Mendelian laws familiar from animal breeding. In this way, the parentage of any individual can be unequivocally established back through two generations. This sort of DNA analysis has obvious importance in breeding programmes for sire and dam identification. It can be used also to distinguish between lines or cultivars, or even species (establishing, perhaps, whether wool passed off as mohair actually came

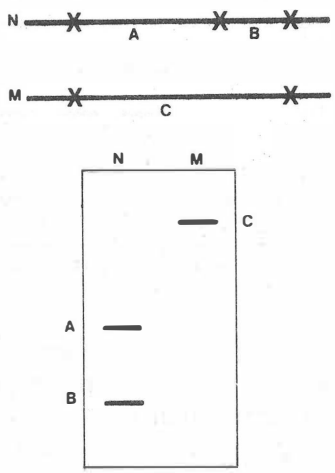


Figure 3: Analysis of restriction fragment length polymorphism (RFLP). A restriction enzyme cuts a normal gene (N)at three target sites (X), producing two fragments (A, BG)> A mutant allele of the same gene (M) has lost one of the target sites, giving only one large DNA fragment (C) as the sum of A and B.

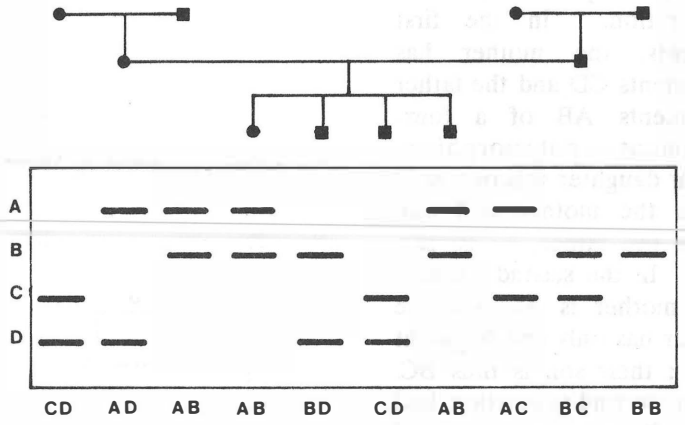


Figure 4: Percentage identification by DNA analysis. RFLP patterns are characteristics of the individual and are inherited from generation to generation in Mendelian fashion. In the pedigree diamgram, circles represent females and squares represent males.

from a goat). DNA analysis (or fingerprinting, as it is sometimes called) is becoming established in forensic medicine and will probably replace blood-typing as a means of identification in the animal industry.

It may happen that a particular RFLP pattern is always found associated with some characteristic or trait. This association with some diseases, such as cystic fibrosis, has been instrumental in finding disease-causing genes in human medicine. The association could equally well be with a desirable production trait, such as resistance to foot rot (for which the Pattersons are selecting in their sheep flock, see page 132). The

RFLP is said to be linked to the particular characteristic.

Genetic selection can be carried out on the basis of RFLP linkage. If RFLP analysis is carried out on individuals with or without the trait in question (selected or not selected for foot-rot resistance, say), some bands will be found that are common to all individuals. These bands are not polymorphic (Figure 5). Another band may vary between individuals but the variation occurs in both groups; this band is polymorphic but not linked.

But one band may be common to all selected individuals, yet be absent in the nonselected population. That band is closely linked to the trait in question and can be used as a marker of whether that trait is present in any individual. In this way selection can be carried out based on the analysis of the DNA, and culling performed without the need for progeny testing. The Pattersons, and other enlightened producers throughout the world, are already doing this, recognizing that the potential benefits far outweigh the extra costs. We need more such brave souls!

Gene Transfer

Gene transfer can be carried out in several ways, most commonly by injecting DNA through a very fine glass needle inserted into one nucleus of an egg, viewed under a microscope, collected a few hours after fertilization (Figure 6). The injected egg is transferred into the oviduct of a foster-mother, who carries it to term. About 20-30% of the offspring have the injected DNA inserted into their own genetic make up, and it is passed on, along with their own genes, to succeeding generations in the normal way. Lines of homozygous transgenic animals carrying the new gene can be bred and multiplied out of the offspring from the injected egg.

In my former laboratory in the United States, we have been producing transgenic mice for the past few years as part of a research

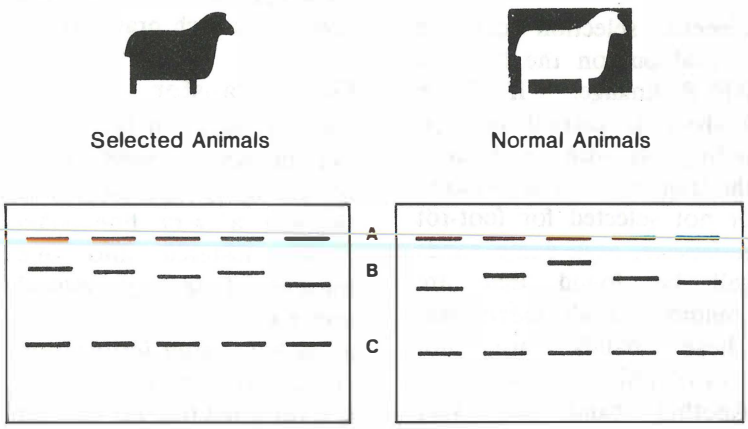


Figure 5: RFLP patterns can be linked to selection traits and used to identify desirable stock for breeding. See text for details.

programme into how hormones control genes. My associates and I have produced mice with several different foreign genes; the mice are normal, healthy animals and the foreign gene works in just the same way as it did in the animal it came from, which varied from mouse, to rabbit, to chicken.

Some genes we have transferred have resulted in valuable mouse models of human diseases, such as cancer.

Understanding how genes work allows us to predict where they will function after transfer to a transgenic animal. In a piece of DNA, the gene itself is surrounded by regions of the DNA which regulate how and where the gene functions. The diagram in Figure 7 shows one of these regulatory regions, called

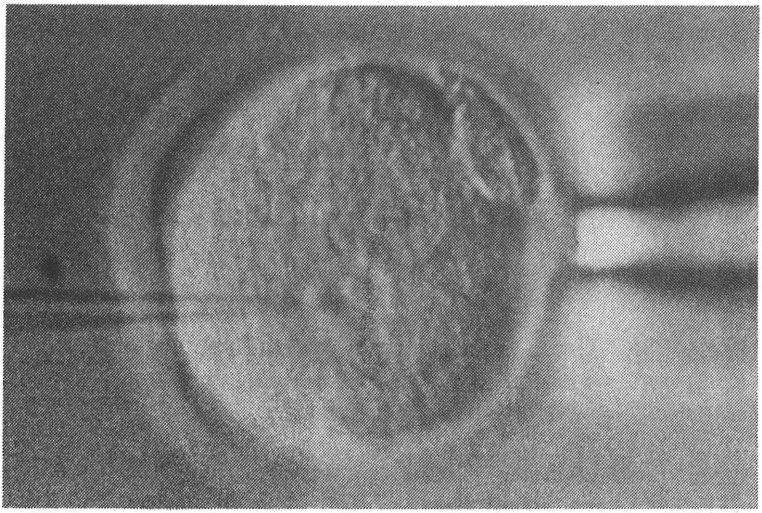


Figure 6: DNA containing a gene to be transferred is injected through the fine glass pipette (at left) into one pronucleus of a fertilized egg, seen under a microscope at a magnification of 400.

the promoter. Every gene has a promoter region which dictates where the gene itself starts and, especially important in gene transfer, in which tissue of the body the gene is supposed to work. This tissue signal accounts for the fact that casein, say, appears in milk and not in saliva or anywhere else in the body. The casein gene promoter has a mammary gland signal. We can isolate the promoter DNA and join it to any gene we like. The mammary signal could be joined to the gene for a blood-clotting protein, for example, which would then be produced in milk; this has already been done on an experimental scale in sheep. In this way we can target the expression of a desirable gene to a particular tissue in a transgenic animal. Genes targeted to reproductive organs could affect fertility,

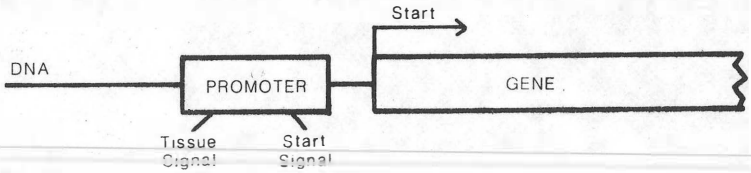


Figure 7: Genes are preceded by control regions, called promoters, which contain signals that indicate where the gene starts and in which tissue it can function.

others targeted to wool follicles could affect fleece characteristics, and so on. New characteristics can thus be introduced and established as a new breeding line.

This kind of gene transfer is no more than using new technology to achieve what farmers have been doing since time immemorial by conventional animal (and plant) breeding - selecting and passing on desirable traits to succeeding generations. It is direct rather than indirect gene transfer. By that I mean that only the gene of interest is transferred; the method is completely specific.

Traditional animal breeding is less specific, because breeding transfers whole chunks of DNA along with the desired trait. The excess baggage may contain genes for undesirable traits and even detrimental ones. Gene transfer has the added advantage of being faster.

The desired trait is introduced immediately and specifically into an animal which becomes the founder of a new line of stock.

The word 'revolution' is vastly overused, but molecular biology is producing capabilities that will truly revolutionize animal

production in the years ahead. Progress may be uneven, setbacks may occur, but we now have the ability to manipulate the very basis of life. Used wisely, this ability will bring unimagined benefits to animal producers and to mankind.

A Practical Approach to Breeding Footrot Resistant Merinos

R. G. and H. M. Patterson*

The Significance of Footrot in Merinos

Footrot is a severe debilitating disease of sheep and indirectly man, being an economic, emotional and social burden. It is the most feared and dreaded of all sheep diseases presently in N.Z. Significant financial losses are incurred by the sheep industry through production foregone, costs of treatment and prevention (Skerman *et al.*, 1988). Despite all the claimed advances in footrot treatment the prevalence today is as high as it ever has been.

The Position of the Merino in New Zealand

Merinos from Australia were initially the main breed of sheep in N.Z. However susceptibility to footrot (Crawford, 1949) (and worms) and an emphasis on export lamb production meant that the Merino retrenched to the high country of the South Island where the extensive native pasture and climate provided conditions that the Merino could cope with (Skerman & Moorhouse, 1987).

The Evidence for Resistance to Disease

It has long been known that breeds of sheep differ in their susceptibility and tolerance to footrot (Emery *et al.*, 1984;

*Longslip Station, Omarama

Baker *et al.*, 1986) and that there is scope to increase natural resistance to infection in Merino flocks through selective breeding (Egerton *et al.*, 1983; Skerman, 1985; Marshall, pers. comm.). Footrot incidence is higher, the severity greater and duration longer in Merinos compared to English breeds of sheep (Stewart *et al.*, 1985). Merinos originated from hot, dry Spain as opposed to Romneys bred in English marshland (NZ Wool Board publication), where over many generations those that succumbed to footrot were selected against. The survival of the human race over the ages despite numerous devastating plagues indicates that there is resistance to disease, otherwise single-cell organisms would be the highest form of life on earth.

The Changing Habitat in the High Country

Recent major pasture development programmes in the high country and consequent increases in stocking rates have created ideal conditions for footrot and worms as elsewhere in N.Z. Breeding sheep to thrive under these challenging conditions however, has been overlooked in favour of continually patching up or ignoring health problems (Mulvaney *et al.*, 1985).

Our Initial Approach to Footrot

In 1985 we had our first major footrot outbreak and tried to eradicate it through tipping sheep up, paring, troughing, vaccinating, antibiotic administration and culling. It soon became increasingly apparent that there had to be more to life than the backbreaking and soul-destroying task of tipping sheep up day in day out. It is extremely difficult to find labour keen to undertake footrotting let along keeping them motivated so that no infected sheep are missed. (It takes only one footrotty to pass back into the mob to nullify attempted eradication; if you're only trying to control the disease it is not so critical). A particular hard-core group in the rams was the most frustrating - "curing"

them one month only to have them re-infected the next month (repeated vaccination did not seem to do anything for this group). Achieving long-term eradication is not easy when, despite two or three clear rounds over six months to a year, there always seems to be another outbreak either from within the flock or from outside. The main limiting factor was that we couldn't trough often enough, ideally weekly during spread periods (Marshall, pers. comm), because of our stock policies especially when ewes had young lambs at foot. Re-achieving footrot-free status is not the whole answer as a population of susceptible Merinos running under favourable conditions for footrot makes reintroduction rapid once contact is made with a source of infection. A population of Merinos bred for footrot resistance on the other hand, exhibit a low liability to footrot infection.

The Traditional Approach

In the past vets have been the main advisers to farmers on animal health remedies however, as clinical salespeople they often have vested interests to protect rather than acting in their clients best interests promoting the natural immunity of animals to disease. The temporary nature of benefits from traditional methods of footrot control, which are both costly and time-consuming, have focused attention on the feasibility of enhancing resistance to the disease through selective breeding (Skerman *et al.*, 1988). Eddie Orr's Corriedales showed us that it could be done (Moorhouse & Skerman, 1988). In order to produce flocks of sheep requiring low maintenance it is essential that any programmed approach must be able to be incorporated easily into normal farm management practices with a minimum of time, effort and money expended. If it isn't simple, it won't be done properly.

The normal sources of replacement sires are from studs or elite flocks. These animals are usually kept

isolated from footrot on footrot-free properties. If footrot does break out every attempt is made to "patch-up" the situation so susceptible animals are retained in the system. They don't encounter a serious challenge until after they are sold and leave the protection of their buffered environment. This is okay while they remain on footrot-free properties but normally surplus stock are transferred at some stage to other properties, particularly with the present move to Merinos. Traditional breeding policies predispose Merinos to footrot at some later stage because susceptible bloodlines remain in the system. For more information see Appendix.

Our Current Approach to Footrot

Rather than a massive on-going investment into facilities, labour, troughing and vaccination we decided that this large investment of resources was much better channelled into a breeding programme that, whilst extremely costly initially, would build upon itself as momentum was gained. After two generations, this will lead to footrot having a minimal risk of impacting upon our flock, partly due to the increasing proportion of resistant stock having a protective effect on those not yet culled. Through this large selection differential the incidence, severity and duration will be lower in the remaining susceptible group compared to unselected Merinos. Remedy costs and production forgone through footrot will virtually disappear (Skerman *et al.*, 1988). These positive psychological impacts are as important as the physical gains. All the way through, by culling, every step is positive, meaning that the light at the end of the tunnel grows brighter year by year. Embarking on any major breeding programme, breaking new ground, will always have its setbacks. The main temptation to overcome is not to retain footrotty sheep in the system no matter what you paid for them or how much you like their subjective attributes. In our case the memory of footrotting for

weeks on end certainly makes the choice an easy one.

What Happens to Merinos in Uncontrolled Footrot Outbreaks

Australian work suggests that in a flock of Merino sheep exposed to uncontrolled outbreaks of footrot there is a spectrum of resistance to infection manifested in four distinct degrees (Egerton *et al.*, 1983). This spectrum ranges from animals which remain chronically infected to those that do not become infected at all. Intermediate levels of resistance are reflected firstly in the time taken by different groups of sheep to become affected after exposure and secondly, to heal after becoming infected. Although a continuum, the four distinct degrees are as follows.

Group A: A minority, approximately 15 - 20% which are not affected at any time i.e., the resistant ones. We have sheep that despite constant challenge have not been affected after 3 years, feet being inspected monthly.

Group B: Those affected late in the spread season develop only transient infections in mild severity (the most responsive to vaccination).

Group C: Those that become affected early in the spring and have relatively persistent infections.

Group D: The most susceptible sheep which carry infections from one spread period to the next i.e., natural remission is low. This group is most likely to have more feet affected and more severe lesions.

The level of resistance exhibited to footrot is gradational up through these degrees depending on the severity of challenge. The transmission of infection is limited by environmental conditions. Hot and dry conditions, or mean daily temperatures below 10 degrees C, greatly slow spread and encourage natural remission (Egerton *et al.*, 1983) (See Figure 1, p. 140).

The Basis of Resistance

The basis of resistance may be two-fold: the skin barrier (Emery *et al.,* 1984) and the immune response (Outteridge *et al.,* 1987). Romneys and Merinos with high natural resistance have elevated levels of two ovine lymphocyte antigens in their blood designated as SY6 and 1B by the McMaster Lab in Sydney. We are currently involved in OLA-typing of our Merinos and are studying gene probes to identify resistant animals through predictive markers, rather than having to expose them to constant challenge.

Unless sheep are challenged it is not obvious by assessing subjective traits which animals are resistant e.g., it is a myth that sheep with black hooves or black spots on their noses are more resistant than others. Sheep that have recovered from footrot are more likely to suffer relapse under challenge than the balance of the flock, as they were obviously more susceptible as evidenced by their breaking down in the first place i.e. having been infected once does not enhance their immunity (Egerton & Roberts, 1971); Emery *et al.,* 1984; Skerman *et al.,* 1988).

Our Footrot Resistance Breeding Programme

We have deliberately exposed (challenged) our Merino rams to footrot in order to identify those most resistant and achieve maximum selection differentials. We have learnt more about the vagaries of footrot by trying to spread it in the rams than by attempting to cure them. We progress gradually towards the elimination of footrot-prone ewes, by culling all those with footrot as they occur over time by visual inspection at shearing and crutching, thus eliminating us from direct physical involvement. No troughing or other remedies are administered so inputs are at a level that we can readily cope with. While the ewes are not deliberately challenged, they are not run as a footrot-free mob either. Resistant rams are used over these ewes to upgrade the resistant status of the next generation.

During the occasional severe outbreak in mixed age ewes, those that remain free from infection are identified and added to the main footrot resistant selection mob. This continuing policy has quickly resulted in the reduction of the percentage of footrotty animals in the 10,000 flock ewes from over 20% to less than 2% per year.

Our present policy is to run up to 2,000 older but more resistant ewes down-country under progeny test to resistant sires that are high wool producers. All ewe and ram progeny are challenged continuously to footrot on irrigated pasture. This is a pre-condition before being used for breeding purposes. Only those remaining free from any footrot lesion (this includes scald) stay in the programme. Progeny from resistant sires and dams will exhibit a greater degree of resistance than progeny from just one resistant parent (Skerman *et al.*, 1988), making them ideal as sires over ewes of unknown resistance status.

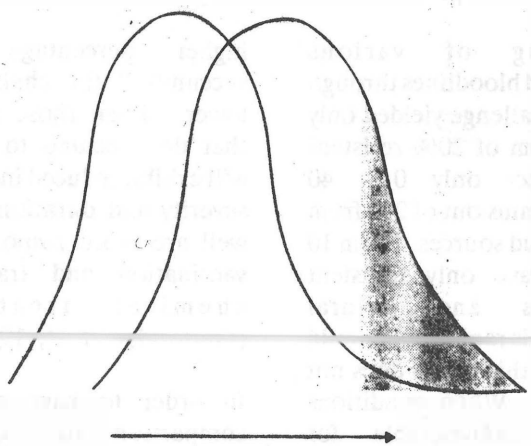
The Integration of Resistance and Production

Genetic variation within Merinos is sufficient to enable selection for resistance without compromising production. Large numbers are essential to provide the opportunity for achieving high selection differentials. We aim to improve the quantity and quality of wool production at the same time as selecting against footrot. For instance if there is an unacceptable wool or body fault in an otherwise top animal, it can be culled because there is one almost as good just below it in the ranking index. There is little point breeding resistant animals if they are less productive than footrotty ones.

Although line breeding (which is a glorified name for inbreeding) may be the easiest and quickest way to achieve flock resistance, we hope to avoid the pitfalls of this approach by maintaining a wide genetic base; i.e., if one of the foundation rams has a serious fault all the flock won't have the same fault.

Screening of various unselected bloodlines through footrot challenge yielded only a maximum of 20% resistant i.e., expect only 0 - 40 resistant rams out of 200 from various stud sources. From 10 - 30% have only transient infections and natural remission is rapid; under mild challenge this group does not succumb. When conditions become unfavourable for footrot spread, no remedial action is required. The balance require remedies for protection or "cure" but readily succumb once seasonal conditions become favourable for footrot again. However resistant rams across ewes that have had 10 - 15% culled from previous footrot incidence leave progeny exhibiting 10 - 40% resistance under severe challenge. A higher percentage don't succumb if the challenge is lower. Even those progeny that do succumb to footrot will exhibit reduced incidence, severity and duration and as well are more responsive to vaccination and traditional chemical treatments (Outteridge *et al.*, 1987).

In order to have a sound comparison with our flock performance we have established a Merino stud based on susceptible as well as resistant bloodlines. Despite the potential contribution that objective measurement and science have to offer the Merino industry, the years of effort by traditional stud breeders should not be overlooked or underestimated.



Increasing incidence, severity, duration

Fig 1.A hypothetical normally distributed Merino sheep population curve showing the liability to footrot infection. On the right an unselected population with shaded area showing the most susceptible group (Group d) that should be culled to reduce challenge. On the left the skewed population distribution that we hope to achieve with selection and breeding, exhibiting markedly lower liability to footrot infection.

The main aim is to breed sufficient highly productive, fine to medium woolled, footrot resistant Merino rams for our own purposes and once this objective is met we intend to breed for worm resistance as well. Surplus stock will be offered to the Merino industry if there is a demand. Our philosophy is to breed Merino sheep that can live in harmony with the environmental conditions under which we want to run them - it doesn't make economic sense to go back to native pastures or change to another breed.

The concepts behind, and the reality of, breeding footrot resistant Merinos are so simple and obvious that we can't understand why it hasn't been achieved before in a commercial flock.

References

Baker, R. L., Skerman, T. M. and Dobbie, J. L. 1986. Inheritance of footrot and footscald in sheep, Journal of Animal Science 63, Supplement 1, 196.

Crawford, S. S. 1949. In: "Sheep and Sheepmen of Canterbury, 1850-1914".

Simpson and Williams Limited, Christchurch, New Zealand. p53.

Egerton, J. R. 1985. Control and eradication of ovine footrot. In: "Footrot in Ruminants". Proceedings of a Worksop, Melbourne, 1985. Steward, D.J.,

Patterson, J.E., McKern, N.M. and Emery, D.L. CSIRO, Australia and Australian Wool Corporation. 35-42pp.

Egerton, J.R., Ribeiro, A.L., Kieran, P.J. and Thorley, C.M. 1983. Onset and remission of ovine footrot. Australian Veterinary Journal 60:334-36.

Egerton, J.R. and Roberts, D.S. 1971. Vaccination against ovine footrot. Journal of Comp. Path. 81:179-85.

Emery, D.L., Stewart, D. J. and Clark, B.L. 1984. The comparative susceptibility of five breeds of sheep to footrot. Australian Veterinary Jounral 61:85-88.

Marshall, J. (pers. comm.). Wagga Wagga, New South Wales, Australia.

Moorhouse, S.R. and Skerman, T.M. 1988. A genetic approach to footrot control. Proceedings of the New Zealand Society of Animal production 48: 139-42.

Mulvaney, C.J., Jackson, R. and Jopp, A.J. 1985. A revised concept of ovine footrot control. In. Footrot in Ruminants" Proceedings of a workshop, Melbourne 1985. Stewart, D.J., Patterson, J.E., McKern, N.M. and Emery, D.L. CSIRO. Australia and

Australian Wool Corporation p.63-67.

New Zealand Wool Board publication. New Zealand Sheep and Their Wool.

Outteridge, P.M., Windon, R.G., Dineen, J.K., Stewart, J. and Skerman, T.M. 1987. Breeding for parasite and footrot resistance in sheep using ovine lymphocyte antigen (OLA) markers. In. "Merino Improvement Programmes in Australia" Proceedings of a National Symposium, Leura, New South Wales 1987. McGuirk, B.J. (Ed.) CSIRO and Australian Wool Corporation. 377-379pp.

Skerman, T.M. 1985. Genetic variation and inheritance of susceptibility of footrot in sheep. In."Footrot in Ruminants" Proceedings of a Workshop, Melbourne 1985. Stewart, D.J., Patterson, J.E., McKern N.M. and Emery, D.L. CSIRO Australia and Australian Wool Corporation. p.73-75.

Skerman, T.M., Johnson, D.L., Kane, D.W. and Clarke, J.N. 1988. Clinical footscald and footrot in a New Zealand Romney flock: Phenotypic and genetic parameters. Australian Journal of Agricultural Research 39: 907-916.

Skerman, T.M. and Moorhouse, S.R. 1987. Broomfield Corriedales: A strain of sheep selectively bred for resistance to footrot. New Zealand Veterinary Jounral 35:101-106.

Stewart, D.J., Emery, D.L., Clark, B.L., Peterson, J.E., Iyer, H. and Jarrett, R.G. 1985. Differences between breeds of sheep and their responses to *Bacteroides nodosus* vaccines. Australian Veterinary Journal 62:116-12 0.

Appendix 1

Footrot - the Traditional Approach

Footrot is a contagious bacterial disease caused by a mixed infection of *Bacteroides nodosus* and *Fusobacterium necrophorum*. It starts off as scale (a moist, red-raw appearance of the skin with disappearance of the hairs between the peds) and progresses to separation or under-run of the horn of the hoof from the underlying soft tissue. There is nearly always a greyish scum and foul odour (but never any pus as in foot abscess) and the hoof feels hot and is often elongated, taking on a yellow or darkish appearance. Footrot causes extreme pain and seriously restricts movement and grazing i.e. sheep normally become lame but some show no outward sign. There have been many different strains of *Bacteroides nodosus* isolated, most infections being multistrain. The strains vary in their ability to under-run and spread; under ideal conditions the more virulent strains result in severe production losses.

The footrot bacteria depend on living tissue for survival being anaerobic obligate parasites which are non-spore forming. Thus the paring of feet to expose the infection to the air kills most of the organisms, favouring natural remission. Whilst the bacteria can survive in the feet of infected sheep for months or even years they cannot survive on pasture for more than 7 - 10 days, being rapidly killed by sunlight and drying. Warm and moist conditions on the other hand favour the rapid spread of footrot. Spring outbreaks are limited by dehydration of the pastures and thus the interdigital skin. A prolonged summer dry period can effect 70 - 80% natural remission. Chronic

carriers however ensure the presence of a source of infection for autumn outbreaks following rain. Mean day temperatures below 10 degrees Celsius (winter) slow spread greatly. It is not uncommon to have up to 75% of a mob affected with footrot within a month of contact between infected and clean but susceptible sheep provided seasonal conditions are favourable.

Farmers' experience, abilities and understanding vary as does their motivation to eradicate, control or live with footrot. Most of the work is done on an ad hoc basis rather than as part of a long term strategy involving good facilities and appropriate treatments. Approaches vary from eradication, intense foot-paring and troughing (control), occasional foot-paring and troughing through to doing as little as possible.

The capabilities and roles of the various traditional treatments for footrot vary, but each is most effective when used as a means of control i.e. to prevent footrot spread and to cure as many existing infections as possible during a spread season.

Topical treatment involves footbathing (preferably after foot-paring to expose the infection) and results in an immediate response to treatment but provides no long term protection against spread. For best results footbathing should begin when footrot prevalence is low i.e. at an early stage before the prevailing superficial lesions progress to advanced or chronic infections. To cure superficial lesions troughing must be repeated every week over a challenge period by walking sheep through a 10% zinc sulphate solution or formalin at 2.5 - 10% concentration. Zinc however is easier to use and penetrates ovine hoof horn more readily than formalin. Preferably the feet should be pre-washed by walking through a race of running water. After moving slowly through a long trough of zinc sulphate solution the sheep should be stood on grating to allow the feet to dry. For more advanced lesions exposure of all the

under-run through foot-paring is essential before soaking the feet for up to an hour in 20% zinc sulphate solution. This troughing and any necessary further paring need to be done once a week for at least a month. Sheep that fail to respond should be culled.

Parenteral chemotherapy involves the injection of penicillin/streptomycin and can be as effective as paring and topical treatment provided environmental conditions are dry. Its main drawback is cost.

Vaccination together with footbathing can be up to 80% effective where there is a high risk of footrot. The timing of vaccination is extremely important because it takes several weeks to build up the sheep's immunity to footrot and the protection may last for only 8 - 12 weeks in the first year. Vaccination must be a preventative (rather than reactionary) measure and used before 5% of the mob are infected. Although its main role is a protective one it also exhibits curative properties.

A booster shot must be administered at least 4 weeks after the initial or sensitising injection. In following years an annual booster is normally sufficient as the protection period can extend up to 20 - 25 weeks, however if both severe spring and autumn outbreaks are encountered two injections will be required for best results.

The main drawbacks to vaccination are:

a) Correct timing is essential but not easily predictable.

b) Cost at 50 cents a shot plus administration.

c) Supplies are not always available as required.

d) At best the protection period is short and may not coincide with outbreaks.

e) Sheep generally show a marked variation in immunological response to vaccination. As vaccination only activates and increases the natural immunity, sheep that are immunologically deficient don't produce sufficient antibodies in response to the vaccine and therefore demonstrate no active immunity. This immune response to vaccination contrasts with the markedly increased antibody

titres in naturally resistant animals, which are protected anyway.

f) Local reactions at inoculation sites can be severe and cause a temporary setback in condition.

Vaccines appears to offer little hope of long-term relief as adjuvants are required that will produce higher and more sustained antibody levels, but unacceptable lesions ensue with these. Currently, vaccine researchers are investigating DNA recombinant technology and slow-release capsules but these are years away.

Canada Geese - current management scene

R T Hutchinson*

For the purposes of this talk the period I intend to focus upon extends from 1986 to the present, but it is relevant to note some of the significant events in the recent past, with respect to management of the bird;

1963 - Canada geese were declared a game bird east of the South Island main trunk railway line, with a special season during February and March each year. This had a major effect on goose numbers around Lake Ellesmere, where as many as 6,000 birds were killed each season following the change.

1973 - Canada geese were declared a game bird throughout their entire range.

1982 - The Wildlife Service, in conjunction with the Acclimatisation Societies, gave an undertaking to the high country Federated Farmers to "significantly reduce" the numbers of Canada geese in the high country over a three-year period. From late that year until 1986, something in the vicinity of 6,400 - 7,500 birds and 2,500 eggs were removed from the population annually.

1984 - Winter aerial trend counts were introduced,

*Department of Conservation, Christchurch

initially in addition to, but later replacing, the autumn aerial trend counts. The winter (June) counts are now recognised as more accurately reflecting the existing population level. It should be remembered however, that they remain only a trend count, not a population census.

1985 - Annual Canada goose egg pricking operations throughout a number of high country nesting areas were discontinued due to a lack of cost effectiveness.

1986 - Several reports of research into various aspects of Canada goose management in the South Island high country, undertaken by the Centre for Resource Management, were completed and published.

Management Strategy

At their August 1986 meeting, the South Island Canada Goose Committee (SICGC) requested that all relevant information on Canada goose management and objectives options be drawn together for consideration at their next meeting. Mr J. Andrews of the (then) Wildlife Service undertook this assignment and presented a discussion paper detailing policy and management options at the Committee's February 1987 meeting. Briefly, the paper reviewed trend count findings, trends in South Island high country pastoral development and its implications for the goose population, and management options and constraints in terms of the bird's legal status under the Wildlife Act 1953. This paper and other research findings noted earlier which were discussed at the same meeting, established, among other points that:

(1) Canada geese in this country display a very high degree of behavioural adaptability to the various forms of population control pressures applied.

(2) There is a significant cost to the game bird managers from implementing current methods of goose population

control ($4.00 - $7.00 per culled bird) which is disproportionate to the licence revenue recovered from Canada goose shooters.

(3) There is a clear cost to high country farmers resulting from geese grazing their crops and/or pasture, in terms of both direct costs of crop establishment and disturbance, and indirect costs of displaced stock units. Degree of impact could vary quite widely however and generalisations could not be made from studies carried out on Grasmere Station, which quantified the cost for that particular station.

(4) Formulation of management policy would require the combined effort of game managers, farmers and scientists for successful adoption and application. Effective on-going management should logically comprise a number of components and be flexible enough to adapt to new information.

An *ad hoc* committee comprising representatives from the Acclimatisation Societies, Federated Farmers and the Department of Conservation (DOC) was formed at this (February 1987) meeting and charged with the preparation of a South Island Canada Goose Management Strategy for presentation and consideration at the next (August 1987) meeting of the Committee. The strategy document, produced following evaluation of responses from all except one Acclimatisation district to a 26-point questionnaire on management options, incorporated the following goals:

a) For the purpose of the strategy, reduction of pasture/crop damage by Canada geese to a minimum, rather than its complete elimination was an acknowledged objective, and there would be continuing need to address such problems.

b) Managers would endeavour to deal adequately with problem areas on a site-specific basis, and every effort would be made to evolve management strategy to deal with problems in their respective areas.

c) South Island and regional populations levels satisfactory to hunter demand and farmer concerns would be established.

d) Goose populations to be managed within those levels determined.

Achievement of these goals would incorporate acceptance that:

- The Canada goose would remain a game bird, listed on the First Schedule of the Wildlife Act 1953.
- The population of sub-adults and non-breeders at Lake Ellesmere are a significant source of recruitment to the Marlborough, North Canterbury and Ashburton districts.
- Some recruitment occurs between regions on North/South and East/West axis.
- Trend count figures cannot be taken as absolute totals, but are adequate for decision-making on numerical matters.

And finally, management effort would apply in the following priority order;

- individual licenced hunter effort,
- licenced hunter effort co-ordinated with fixed-wing aircraft and boat assistance,
- moult and flapper drives,
- helicopter shoots,
- chemical control.

The document went on to establish three management regions - Northern, Central and Southern - on the following basis;

Northern : Marlborough, North Canterbury and Ashburton Acclimatisation districts, with the two Thumb Range as the Southern boundary.

Central : South Canterbury and Waitaki Valley Acclimatisation districts, with the Lindis Pass as the Southern boundary.

Southern : Otago, Southland and Southern Lakes Acclimatisation districts.

Target Population Levels

The *ad hoc* committee agreed on a South Island population of 16,500 geese, which was to be distributed between the three regions as follows;

Northern	=	11,600
Central	=	3,300
Southern	=	1,500

These figures were not accepted by the full committee at its August 1987 meeting however, and following considerable discussion, were revised upwards to a South Island population of 24,900, with regional totals of;

Northern	=	17,600
Central	=	3,300
Southern	=	4,000

The revised figures were not acceptable to the Federated Farmers representative, but were put to a vote and carried.

In discussing management direction, the document advocated continuing focus on organised sportsman shoots, flapper and moult drives as the primary means of achieving the identified population levels but included qualifications that managers responsible for Lake Ellesmere should arrange organised, large-scale hunter operations, recognise the need for a significant reduction to compliment high country effort and as required, undertake moult drives to achieve reductions supplementary to high country control effort. Additional qualifications were that St. James Station was a "special case" where chemical control may not be discounted and the reserve status of Lake Grasmere and the Maori Lakes should be reassessed with the objective of allowing waterfowl hunting under

controlled conditions as a means of controlling damage to adjacent pasture by Canada geese.

Closing general comment within the strategy document stated that;

- direct application would imply acceptance that significant progress toward Island and Regional population goals would be achieved by June 1989;
- control priority must be in the high country and in particularly sensitive areas such as Lake Ellesmere, DOC staff would undertake control measures;
- egg pricking is not considered a cost effective means of control but remained an option in some situations when associated with removal of breeding birds;
- the use of chemical control (poison) should remain an option but in view of implications of political, bureacratic and hunter opposition, a need exists to investigate the potential effectiveness and risks. The DOC is considered the appropriate body to initiate investigation and undertake any control measures involving poison, deemed necessary.

The whole issue of Canada goose management then progressed to the annual general meeting of the Council of South Island Acclimatisation Societies (CSIAS) on 19 March, 1989, where the Committee chairman's report, together with the following recommendations, were adopted;

1. Removal of Canada geese from the First Schedule of the Wildlife Act 1953 for the whole of New Zealand as a management reduction option, not be supported.

2. The NZAS Goose Management Plan recognise and adopt the 14 August target population levels as recommended by the CSIAS Goose Committee.

The target population levels referred to above are;

Northern Zone:
North Canterbury Coastal
= 14,000
North Canterbury High Country
= 2,500*
Marlborough
= 1,500
Ashburton
= 600 18,600

Central Zone:
= 3,300

Southern Zone:
= 4,000

25,900

** This figure has escalated by 1,000 birds from that adopted by the SICGC on 14/8/87.*

3. Canada geese be subject to the First and Third Schedule listings with geese generally to the East of State Highway One being retained on the First Schedule and noting that State Highway One can only be considered as a guideline for this demarcation, with Societies to determine boundaries.

4. The NZAS only reimburse control costs for operations undertaken in the First Schedule Districts where First Schedule Districts are generally to the east of State Highway One. The 17 February meeting of the SICGC was the final one for the then existing membership. Following an earlier resolution of the CSIAS, Goose Committee membership will in future be comprised of;

3 Members; appointed on rotation by the CSIAS; being one from, and nominated by, each of the South Island Canada Goose management regions;

1 member; appointed by the CSIAS following nomination by the North Canterbury Acclimatisation Society;

1 member; appointed by the CSIAS following nomination by the CSIAS;

1 member; representing the Department of Conservation;

1 representative; appointed by the CSIAS following nomination by Federated Farmers.

Neither the DOC member or Federated Farmers representative will have voting rights on the new committee - the former by choice, the latter by CSIAS resolution.

DOC Management Initiatives

Toward the end of 1987 the Department of Conservation contracted the Centre for Resource Management to report on management planning issues and options for Canada geese. A report entitled "Property rights and Canada goose management" was produced in July 1988, the content of which was discussed between DOC representatives and the authors during December the same year. The Department has since made no commitment to endorse the report or any of its recommendations.

The report advocated granting;

- Acclimatisation Societies the power to manage game,
- land occupiers the right to kill Canada geese,
- land occupiers the right to farm Canada geese,
- Acclimatisation Societies and hunters the right to buy hunting rights. The report was subsequently released to the Acclimatisation Societies, who collectively rejected its contents at the next SICGC meeting on 17 February 1989.

In another development during the past (1988) year, the Department prepared a briefing report for the Minister of Conservation on Control of Canada Geese Causing Damage. Stimulus for the report was a proposal from Mr R. Grigg of Barrossa Station, on behalf of the farming community, to reduce Canada goose flocks causing damage by the use of poison.

In the report's conclusion the Department proposed adoption of an interim management strategy for the species, the elements of which would be:

1. A Canada goose moult cull supervised by the Department, undertaken at Lake Ellesmere in January 1989;

2. Alleviation of present short term pasture predation problems by intensification of traditional control methods such as disruption, ground and helicopter shoots;

3. Offering of birds from the Ellesmere cull for productive use;

4. Poisoning be used only as a short term control option and then only in extreme circumstances as a last resort, where conventional methods have been ineffective.

Commercial Use

In December 1987 the Department approved an application to carry out commercial trials on Canada goose husbandry. 150 birds were removed from Lake Pukaki during the January 1988 moult drive for the trial and transported to Rata Peaks Station in the upper Rangitata Valley. Monitoring of weight gain/loss, and general bird behaviour during the following 11 months indicated there was some potential in the concept, which resulted in formation of a commercial partnership to undertake a large-scale trial on Northbank Station, to the South-West of Lake Ellesmere.

Society concern about commercial use of the bird resulted in the SICGC and the National Executive of Acclimatisation Societies canvassing the position of the whole Society movement to commercial use of culled geese. On a split decision, Societies narrowly rejected any proposals for commercial use of game. It is interesting to note that, although there was a clear majority of North Island Societies against commercial use, South Island Societies voted six to four in favour. This reflects the geographical distribution pattern of goose problems. As a result the SICGC felt bound by the majority decision to come out in

opposition to commercial use of culled Canada geese. It put forward a number of resolutions on this topic which were adopted by the CSIAS meeting in October 1988. The resolutions were to the effect that;

1. existing (Rata Peaks) goose husbandry trials conclude;

2. no new husbandry trials be supported, and

3. commercialisation of Canada geese be opposed, pending development of a NZAS Canada goose management plan.

At the regional level, negotiations occurred between the DOC and the Acclimatisation Societies regarding implementation of a moult cull on Lake Ellesmere. A discussion paper on the possible benefits resulting from an Ellesmere cull prepared by Kerry Potts of the Department's Science Directorate, identified likely benefits to high country farmers from reduced flock sizes in a number of high country localities the following autumn. Other statistical evaluation of aerial trend count data indicated that up to 10,000 birds may have to be culled to have an appreciable effect and return the population to pre-1984 levels of about 7000.

Agreement to the removal of 3,000 birds was reached in November 1988 and approximately 2961 Canada geese were then taken from Lake Ellesmere following the January 1989 moult drive and banding operation, the birds being passed to the commercial partnership for extended commercial trials.

Diversionary Feeding

The establishment and use of diversionary feeding areas for game birds, particularly waterfowl, to minimise crop damage is well known overseas, especially in North America. Its use has also been advocated by some game members in this country as a means of minimising farm

pasture and crop damage by Canada geese.

Following earlier negotiations between DOC and Electricorp, an area of approximately 8 hectares of land bordering the northern shoreline of Lake Pukaki was cleared and oversown with a grass seed mixture during the autumn of 1987 to try and establish a diversionary feeding area for geese in the Pukaki area. Observations of goose utilisation of this area since its establishment are quite encouraging, but the concept really requires positive adoption by both the Acclimatisation Society movement and high country farmers before it can be expected to provide any noticeable level of benefit to management and damage control.

Aerial Trend Counts

The following table shows the aerial trend count results for various sections of the region and the South Island total for the years 1986 to 1989;

The figures clearly show an appreciable change in the trend manifest during the three-year period to 1988. More interesting is the indication that the greatest degree of change is within the Northern region and specific to the Lake Ellesmere population. The following table of Canada goose counts for Lake Ellesmere since February 1985 tends to reinforce this impression.

Control Cull and Recreational Hunting

Between January 1988 and May 1989 the Marlborough, North Canterbury, Ashburton, South Canterbury and Waitaki Valley Acclimatisation Societies have carried out organised sportsman shoots, moult drives and control culls in a variety of high country locations from Molesworth to Lake Ohau and including lakes Ellesmere and Forsyth. These operations were additional to the usual flapper/moult drives of known high country nesting areas and have resulted in the destruction of 7,504 geese.

Year	Coastal Canty	Northern	Central	Southern	South Island
1986	15,129	18.070	6,570	3,954	28,594
1987	15,618	20,311	8,299	4,023	32,633
1988	18,234	24,099	8,871	4,387	37,357
1989	11,346	15,256	8,068	3,782	27,106

These figures clearly show an appreciable change in the trend manifest during the three-year period to 1988. More interesting is the indication that the greatest degree of change is within the Northern region and specific to the Lake Ellesmere population. The following table of Canada goose counts for Lake Ellesmere since February 1985 tends to reinforce this impression.

Known recreational hunter kills in the area to the south of the Rakaia River during the same period totalled 2,338 birds, which together with the 2,961 removed from Lake Ellesmere following the January 1989 moult drive, accounts for a minimum 12,803 geese removed from the region's population during the 17-month period. Note that the above figures do not include recreational hunter kills within the North Canterbury Acclimatisation District during the same period.

The recreational hunter kill for the North Canterbury Acclimatisation District may well have increased above earlier levels during the past 18 months as a result of greater promotion of Canada goose hunting by the Acclimatisation Society movement. The NCAS now leases from DOC, the lower Selwyn hut No. 25 for the primary purpose of providing

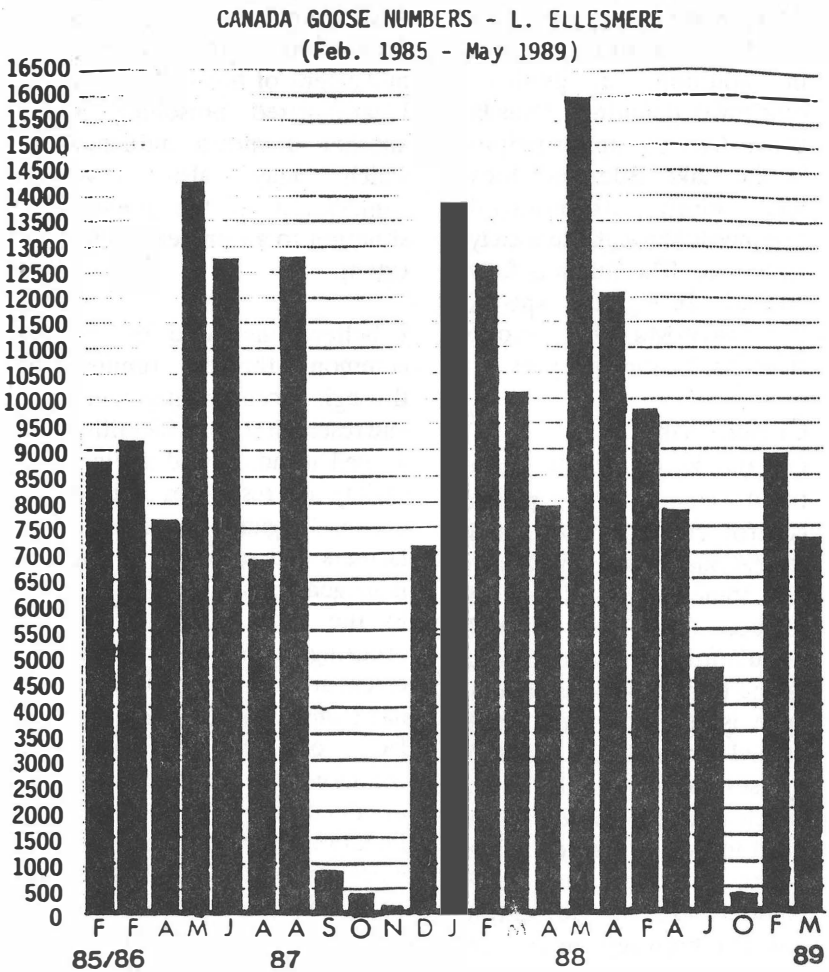


Figure 1: Ground count Canada goose numbers on Lake Ellesmere - note count results for May

accommodation and hunting information to goose shooters. In addition, a publicity brochure detailing Canada goose hunting opportunities in the Lake Ellesmere area has been distributed nationwide through the society structure. The hut was fully booked during the special February/March goose shooting season this year.

Conclusion

On the basis of this year's trend count date, recent control cull operations and recreational hunter effort have had some degree of desired impact on the overall population, but the South Island total of birds as at mid-June is still above the level agreed by the SICGC (24,900) by several thousand birds, which means there remains a need for additional reduction effort. The fact that trend count results for the central and Southern regions remain closely comparable to earlier years must have some significance in terms of bird movements and the recent severe drought throughout Canterbury could also have influenced survival and movement of birds.

Unauthorised poisoning is another unknown influence which may also have contributed to the present situation to an unmeasurable extent.

I believe that one of the common themes running through recent management and research reports identifies a need to adopt and apply a variety of responses agreed between game managers, farmers and scientists in any management strategy applied to the bird. This is not occuring to any significant extent at present. Possibly the most obvious problem is the lack of any significant commonality between the Acclimatisation Society and Federated Farmers positions, particularly with respect to acceptable populations. The recent CSIAS decision to exclude Federated Farmers from any opportunity of contributing effectively to the deliberations of the SICGC is more likely to ensure

entrenchment of present differences than it is to resolve them, and no one will benefit from that situation.

References

Andrew, J. Discussion Paper on Canada Geese (*Branta canadensis*) with regard to Policy, Objectives and Management In The South Island. Unpublished discussion paper for South Island Canada Goose Committee, Feb. 1987. 10 pp.

Costello, E.J.; Ackroyd, P.; Hide, R.P.; Hughey, K.F.D. July 1988 Property rights and Canada goose management. Centre for Resource Management, Lincoln College. Unpublished report to the Department of Conservation 19 pp.

Harris, P.S.; Potts, K.J.; Costello, E.J. 1986. An Assessment Of The Economic Impact Of Canada Goose Grazing On Grasmere Station Using A Farm Management Modelling Technique Centre for Resource Management, Lincoln College.

Leathers, K.L.; Costello, E.J. 1986. The Economics Of Canada Goose Management In New Zealand. Centre for Resource Management, Lincoln College.

Potts, K.J.; An Analysis Of Canada Goose (*Branta canadensis*) Trend Counts Made In The South Island From 1975 To 1983. Wildlife Service Technical Report No.5, 1984, 14 pp.

Potts, K.J.; The Significance of the 1984 April Trend Counts and Recommendations for the Implementation of Winter Counts. Unpublished Report, July 1984, 11 pp.

Potts, K.J.; Leg Band, Web Tag And Neck Collar Recoveries For Canada Geese (*Branta canadensis*)

In The South Island. Unpublished report, Aug 1985, 25 pp.

Potts, K.J.; Movements of Canada geese between Lake Ellesmere and the high country - a discussion of possible benefits for high country farmers resulting from culling on Ellesmere. Unpublished discussion paper, Aug 1987, 4 pp.

Cleaning up the game of Canada goose management

Rodney P. Hide*

Introduction

What should be done about Canada geese depends upon whose hat you are wearing.

Let us put on the hat of the hunter:

Canada geese are the best birds to hunt. It's a New Zealander's right to hunt them. Farmers grumble about the damage geese do - but farmers grumble about everything. Canada geese numbers should be maintained.

Now let us try the farmer's hat:

Canada geese are a bloody nuisance. They are a pest. They destroy crops and pasture.

There's thousands of the bloody things and hunters only pop a few a year. Hunting is good sport, but farming is the backbone of the country. Canada goose numbers should be drastically reduced.

Finally, let us try the hat of a Department of Conservation worker:

Canada geese are both a pest and a resource. Management requires a careful balancing of the costs and benefits of control. More research is needed.

And there we have it -the game of Canada goose

*Centre for Resource Management, Lincoln University

management. On one side, the hunters; on the other, the farmers. Government takes the field as referee. However, this referee is like no other. This referee takes sides. Sometimes government supports hunters; other times it supports farmers. Government in this way scores a few points for itself. Everyone thus plays the game. Hunters, farmers, and government; they all play the game of Canada goose management.

Good rules would make for a good game. Unfortunately, the rules of Canada goose management are terrible. They make for a scrappy game. Hunters fight farmers. Farmers fight hunters. Everyone fights the Department of Conservation. No one wins the game of Canada goose management - everyone loses. Hunters lose, farmers lose, and taxpayers lose. We could and we should do better. We should change the rules so that Canada goose management is a friendly game played to everyone's advantage.

This is the conclusion my colleagues and I reached in a study we did last year for the Department of Conservation.[1] In what follows I will cover the main points of that study. I will explain why present rules make Canada goose management such a scrappy game and why they make losers of everyone. I will describe the changes needed to improve the game, and I will detail how these changes can be brought about. I will thus explain how Canada goose management can be played to everyone's advantage.

Present rules make a pest of Canada geese.

It is the rules of Canada goose management that make a serious pest of Canada geese. Without these rules Canada geese would be at worst a mild nuisance and at best a valuable resource.

Present rules prevent farmers making money out of Canada geese.

Farmers are not allowed to

charge for hunting on their land.[2] They are also not allowed to farm Canada geese without government say-so.[3] Canada geese are therefore a pest to farmers, not a resource.

Present rules not only make Canada geese a pest, but also make them a serious pest. Farmers are prevented from controlling Canada geese as they would any other pest. Canada geese are declared to be game and may be killed only by sporting methods.[4] Farmers cannot control Canada geese. Canada geese are therefore a serious pest for farmers.

We thus see that present rules convert Canada geese from a potentially valuable resource to a serious pest. I now wish to explain how present rules make for a scrappy game.

Present rules provide a scrappy game.

The rules of Canada goose management set hunters and farmers on a collision course. If it were not for these rules there would not be a scrap. The scrap is caused by the way present rules distribute costs and benefits. Present rules place the cost of Canada goose damage on farmers. Farmers cannot profit from the bird at all. It is hunters who capture all the benefits. They get pleasure from hunting geese. The damage Canada geese cause is not a cost to them.

The fewer geese there are, the better-off are the farmers. The more geese there are, the better-off are the hunters. Whereas reducing bird numbers benefits farmers but costs hunters, maintaining numbers costs farmers but benefits hunters. The game is such that one side can profit only at the expense of the other. Hence the scrap.

And because farmers want numbers reduced, they exaggerate the benefits of control and downplay the costs. And because hunters want numbers maintained, they exaggerate the costs of control and downplay the

benefits. This exaggeration only intensifies the scrap.

Present rules not only make a serious pest of Canada geese, but also make for a scrappy game. I will now explain why present rules make losers of everyone.

Present rules make losers of everyone.

The game of Canada goose management is controlled by government. It is the Crown that owns Canada geese.[5]

(Incidentally, although the Crown owns Canada geese, it does not accept liability for the damage they do.[6] This is why the costs fall on farmers.)

The control of Canada geese is thus decided by government. Farmers in consequence must lobby to have goose numbers reduced, and hunters must lobby to have numbers maintained. This is the game. Each side uses its political clout to achieve an advantage at the expense of the other. Political clout decides Canada goose management.

Government is helped by the South Island Canada Goose Committee. This Committee is made up of hunter, farmer, and government representatives. The referee thus takes advice from a committee of player representatives. This does nothing to improve the game. It simply dilutes responsibility. Indeed, it is not even clear who decides Canada goose management. The actual referee in government is invisible. And whoever is calling the shots certainly does not bear the costs of his decisions. The costs of management are shunted elsewhere. The costs of goose damage are borne by farmers, and control costs are borne by farmers, hunters and taxpayers. Whoever is calling the shots does not carry the can.

No rules exist to decide the balance between the interests of hunters and farmers. Government simply adjusts control operations to minimise political fall-out. The political costs of increased control are thus balanced against the political costs of less control.

Canada goose management in consequence requires both sides to bear something of a cost. Hunters must accept some control. Farmers must accept some damage. Each side must concede something to the other. Canada goose management is a loss-loss game, not a win-win game.

Present rules thus make losers of everyone. No one gets what he wants, and the game itself costs. Hunters and farmers must spend time lobbying government in an effort to protect and further what advantage they have. Hunters are diverted away from game management, and farmers are diverted away from farming. Both farming and game management suffer in consequence. The game is perhaps only made bearable for the players by the financial support taxpayers provide. Taxpayers subsidise management and control. They lose out, and don't even play the game.

The game need not be played like this. It need not be a scrappy game that produces only losers. The rules can be changed so as to make winners out of everyone. I will now explain how this can be done.

Providing a better game.

Canada goose management should be depoliticised. Government should get right out of the game.

Game-bird management should be solely the responsibility of Acclimatisation Societies. They are the regional representatives of hunters and are in the best position to judge what hunters want. The agents responsible for game (including Canada geese) should be made responsive to hunters' wants.

Acclimatisation Societies may well object that they cannot raise the necessary funds from their members. However, the test of good management is to be able to provide a service that users want at a price they are both willing and able to pay. The proper response to insufficient revenue is to modify the service provided, not dip into taxpayers' pockets.

Farmers should have the right to destroy geese on their land. Individual farmers are in a better position than any committee or government department to decide appropriate pest control strategies for their farms. Farmers should also be allowed to poison geese. Outlawing poisoning adds unnecessarily to the costs of control. If farmers were allowed to poison Canada geese on their own land geese would be converted from a major pest to a mild nuisance.

Farmers should also be allowed freely to farm Canada geese commercially and to charge hunters to shoot on their land. Farmers could then profit from the bird. Canada geese would thereby be converted from a pest to a potential resource. The prospect of profits would also encourage farmers to take into account the interests of hunters and potential consumers. Farmers would thus be encouraged to manage Canada geese on their land with an eye to the interests of others.

Three main reforms required.

Three main reforms are thus required:

- Make Acclimatisation Societies responsible for Canada goose management.
- Allow farmers to poison Canada geese.
- Allow farmers to profit from the bird.

These three reforms would make hunters and farmers have regard to each others' interests. Farmers would have to consider what hunters (represented by their Acclimatisation Societies) are prepared to pay to maintain Canada goose numbers. And hunters would have to consider what it costs to compensate farmers. The game would be completely changed. Each side would have to weigh up the costs and benefits of control. The expectations of both hunters and farmers would be revised downwards in light of the economics of Canada goose control.

Moreover, any bargains struck would be to the advantage of

both parties - otherwise the bargain would not be struck. Both parties would profit from any deal. Under present rules, deals require political compromise and incur uncompensated costs for both sides. Allowing trade would change Canada goose management from a loss-loss game to a win-win game.

These three reforms would also make each and every decision maker accountable for the costs of his actions. Those making decisions on behalf of hunters would be accountable to their members - after all, their revenue would have to cover their costs. Farmers would likewise be responsible for the costs and benefits of their control decisions through the profit and loss system that drives New Zealand farming - and farmers' cost-benefit calculations would now include the benefits to be had from better providing for hunting.

The move from the present rules to these new rules might look like a cost to hunters. After all, hunters at present can maintain Canada goose numbers without the need to compensate farmers. However, hunters can only maintain bird numbers at the expense of constant lobbying, and at the expense of incurring the wrath of farmers. Under the proposed rules they would no longer need to lobby government, nor fight farmers. Moreover, they could direct their attention to providing better hunting by private negotiation. The result may well be improved hunting. It may well be that hunters do not lose out in the move to the rules I have proposed. More particularly, once the new rules are in place, Canada goose management would be a game in which hunters and farmers co-operate, rather than fight. This can only be to the long term advantage of hunting in New Zealand. We have thus seen how changes to the present rules within which Canada geese are managed can change the game for the better. I will now explain how these changes can be brought about.

Rules easily changed.

The game of Canada goose management is easily converted from a bitter contest, that no one wins, to a co-operative game that produces only winners. A few minor changes to present rules is all that is required.

More accountable game management is already in the pipeline. Government has decided to hand responsibility for game over to reformed Acclimatisation Societies.

The other reforms are quite simple. The steps are as follows:

The Director-General of Conservation should authorise under section 54 of the *Wildlife Act 1953* the destruction of Canada geese on private land by farmers as a matter of course. Authorisation should not be conditional because general regulations for the use of poisons to protect other wildlife can be promulgated under the *Wildlife Act 1953*[7] and, for any other purpose, under the *Pesticides Act 1979*. Authorisation should be effective for five years to allow farmers to plan long term control strategies.

The right for farmers to destroy Canada geese should *not* be granted by altering the game status of Canada geese. Altering the classification of Canada geese would mean that Acclimatisation Societies could no longer administer Canada goose hunting. They could then no longer represent hunters with respect to Canada geese or raise funds for Canada goose management.

Canada geese should *not* be declared a pest of either local or national importance under the *Agricultural Pests Destruction Act 1967*. To do so would oblige Pest Destruction Boards to destroy the bird irrespective of the economics of control or the value of the bird to hunters.

The Director-General of Conservation should also allow farmers to capture Canada geese and take their eggs on their land and to farm them as a matter of course. The Director-General has these powers under

subsections 23(1) and 54(1) of the *Wildlife Act 1953.*

The sale of hunting rights requires repeal of sections 23(1) and 23(2) of the *Wildlife Act 1953.* These sections forbid the sale of hunting rights. Contrary to popular opinion, the ban on the sale of hunting rights does not work in favour of hunters' interests. It works against their interests. Farmers will not treat hunting as a land use comparable to other land uses until such time as they can sell hunting rights.

I have shown how the game of Canada goose management can be played to everyone's advantage. I have also shown how easily the change can be brought about. The only snag is with hunters and farmers themselves. Only time will tell whether these combatants see it to be in their interests to declare peace after such a long and debilitating war.

Conclusion

The problem with Canada goose management lies not with the bird itself. Nor does it lie with hunters, farmers, or the Department of Conservation. The problem lies with the present rules of the game. These rules make for a bitter contest that neither hunters nor farmers can win.

The rules could and should be changed. Acclimatisation Societies should shoulder the responsibility for game-bird management. Farmers should be allowed to poison Canada geese on their land. Farmers should also be allowed to sell hunting rights and should be allowed to farm the bird. Taxpayers' money should not be used either to manage or to control Canada geese.

It is time to take the politics out of Canada goose management. The politics should be taken out and game management put back in.

References

1. E.J. Costello; P. Ackroyd; R.P. Hide; K.F.D. Hughey, 1988. Property Rights and Canada Goose Management, Centre for Resource Management, 1988.

2. *Wildlife Act 1953* s. 23(2).

3. *Id.* ss. 23(1), 33.

4. *Id.* ss. 17, 18, 19(3), 22.

5. *Id.* s.57(3).

6. *Id.*

7. *Id.* ss. 72(1), 72(2)(k).

Changing to Merinos

R. Brown*

I'm sure the present Government would fully approve of me advising you to change to Merinos, as they seem determined to change every other aspect of our lives for better or worse.

Even without the influence of Government, it is very fashionable to be changing to Merinos at present, so I guess it is timely to reflect on my reasons when I made the decision to change to Merinos 19 years ago.

"Glenthorne" country ranges in altitude from 500m - 2100m of which 55% is classified as class 8 country. The average rainfall at the homestead is 1500 mm increasing to the west of the property. In 1970 when I purchased the property the flock comprised 6000 Halfbreds and 50 cattle. The property was virtually undeveloped with no cultivated paddocks for winter feed or hay and very little oversown country. After a development programme involving the cultivation of 750 acres and oversowing and topdressing of 2000 acres, the property now carries 9500 Merino sheep including 600 stud sheep and 300 cattle.

When I considered the topography, and the undeveloped state of the property, and the fact that only a small percentage of the property was available for winter grazing (because of snow) and much of this still unsuitable for wintering ewes, it was obvious the property was best suited to wool production.

---

*Glenthorne Station, Lake Coleridge

The accounts of the previous owners showed that even with a Halfbred flock, sale stock were of only minor importance.

With this in mind and the previous experience I had gained working on hill and high country properties with both Merino and Halfbred sheep, I considered the best breed for wool production on this country was the Merino.

To my knowledge Glenthorne had not had a footrot problem, so this was never really a consideration.

- I considered Merinos would do as well if not better on the country.
- I believed they would produce more wool.
- I thought Merino wool had usually enjoyed a price advantage over stronger wool.

I was soon proved right on the first two counts and the figures below indicate the wool weight advantage in favour of Merinos.

There is a significant difference between the Halfbred and Merino hoggets. The ewe and wether figures are not so easy to interpret because I was unable to separate the Merino ewes and wethers. However you will note the Merino ewes and wethers combined equalled the Halfbred wethers. We know that wethers clip more than ewes so it was obvious that the Merino wethers were well above the Halfbred wethers and the Merino ewe weights would come somewhere between the Halfbred ewes and wethers.

Another point is that as the aim was to change to Merinos the Merino ewes and wethers had been culled lighter and the Halfbreds heavily, retaining only those that were good wool clippers.

The third reason - "price advantage" has been an interesting one. Remember, in the early 70s wool prices were very depressed. My first clip was Halfbred and the top price received was 67c per kg.

	1974	1977
1/2 bred hog.	1.6 kg	1.85 kg
Mer. hog.	2.5 kg	2.62 kg
1/2 bred E	2.7 kg	2.24 kg
1/2 bred W	3.34 kg	3.47 kg
Mer. E & W	3.23 kg	3.40 kg

The next year, 1971, my Merino wool sold for 90c kg and the Halfbred for 74c kg. It was not until 1972 when wool prices jumped significantly that I felt my decision to buy a high country wool growing property was vindicated. That year I sold a five bale line of Merino wool for 190c per kg. My best Halfbred lines of 24 bales made 200c.

Prices stayed along these levels until 1976 when the market lifted again. This time my best Merino line made 261c and Halfbred 269c (at this time we had significant quantities of both types).

In the late 70s and 80s as the price differential became more apparent we no longer had Halfbred lines to compare. The advantage we had enjoyed in these earlier years was due to the fact that the Merino suited the country better. Furthermore we had more wool to sell. The expected price advantage did not eventuate to any significant degree until the 80s. I think we are all familiar with how significant this has been in recent years.

It is also interesting to note the different values of stock at this time. We were retaining Merino ewes with an average ewe value of $3.00 and selling Halfbred ewes for $5.00.

At this time Merinos were very unpopular but Halfbreds were reasonably well sought after, so consequently we continued selling our cull young stock as fine Halfbreds for quite some years. The last time we tried this trick, one buyer looked over the

rail and asked "What's the other half?" I realised we had come to the end of this line and it was now time to admit we had a Merino flock.

However it was not too long after this that the price pendulum began to swing in favour of the Merino.

I used both methods - buying in and breeding up. Initially I purchased ewes, and in the first season replaced 1/4 of the ewe flock with Merinos. At first I was against breeding up because I wanted to have true Merinos and not have throwbacks for the next 20 years so continued to use Halfbred rams over the Halfbred ewes for several years.

However a severe shortage of money and a realisation that the bought in ewes had not shifted very well coupled with advice from other good stockmen, persuaded me to use Merino rams over all ewes - Merino and Halfbred. This remained the policy until some years later when the livestock incentive scheme was introduced. This came at an opportune time for the station as we had undertaken significant development and were looking to increase stock.

The decision was made to use this opportunity to speed up the change and introduce well bred Merino ewes. I purchased several of the top priced and most sought after adult 4-tooth ewes at the Tekapo sale.

The bought in sheep shifted better this time because Glenthorne was now in a more improved condition, however they still do not do as well as home grown sheep.

Our policy of using only Merino rams has remained, with the exception that a few years ago when Merino lambs were of almost nil value, and fat lambs were selling very well, we introduced a terminal sire over some of the poorer woolled ewes. The sires used were Dorset Down and then Border Leicester.

This worked very well in still maintaining a straight ewe flock producing quality wool

but more than doubling the value of the ewes' progeny.

We have maintained this very flexible policy. Glenthorne now produces surplus lambs (presently Merino) and if the meat industry sorts itself out and fat lambs are again worth more than straight Merino lambs we can change very quickly and once again put a terminal sire over our poorer woolled ewes.

Who knows? Presently I am guided by experience of the past. I believe large framed medium type sheep can produce the most wool and can withstand the harsh climate and high rainfall which my stock are subject to.

The good frame ewe also has an advantage should there be a financial reward in once again producing lambs for the meat trade.

However, should the wool market indicate that significant premiums for fineness can be expected in the future we could introduce rams from the fine branch of our registered stud. Progeny from this line has not been used in the run flock to date.

Anyone contemplating changing to Merinos should consider the long term aims and strengths of their property. Changing the breed of sheep on a property is not a quick easy process. There is a well-known saying that you only successfully change breeds once in your lifetime.

I consider both methods of changing are successful.

The buying in method is quicker but expensive in the short term and is also limited as to where stock can be purchased depending on your property. Always remember the old saying that sheep do not successfully move uphill. i.e. You shouldn't buy sheep from developed easy country and expect them to do well on native high country.

Conversely sheep which have been extensively run on native country may not adapt to a confined rotational grazing regime. Many traditional high country properties have undertaken large development

and fencing programs in recent years and sheep on these properties, especially young stock, are often rotationally grazed in large mobs.

Merinos will adapt to this type of management but I would suggest they are not naturally as well suited to this as many other breeds. If you are considering buying Merinos and running them under this sort of regime, I would suggest you purchase from a flock which is already run intensively at least for some of the season.

The breeding up method is slower and there will be a few throwbacks for many years but against this the sheep bred on the place will always do well. (I'm not convinced that a streak of Halfbred is necessarily a bad thing. Whether it's a touch of hybrid vigour or not I'm not sure, but I do believe it adds to the constitution).

Consider the choice of fine, medium or strong woolled sheep - remembering that fine wool must always enjoy a significant price premium over strong wool to compensate for the difference in weight. Some areas are far better at producing wool of different qualities than others.

One aspect often overlooked is the nourishment and handle of the wool. As well as looking at the crimp, look for the nourishment and feel the wool. The nourishment is extremely important *especially* in higher rainfall areas. Do not be led astray by advice suggesting that the highest clean fleece weight is always the aim. Poorly nourished or dry high yielding wool will not stand up to high rainfall conditions nor wool that is of a heavy greasy type that does not dry quickly.

Be wary of a soft open back if you have a dust or sand problem. The one bale that tops the sale is not necessarily the answer if the rest of the clip is in the sandy line. Likewise the maximum possible wool weight may not be the answer if it all goes into the yellow line.

If breeding up be very careful in ram selection. If you are aiming for a fine micron, do it slowly and in stages i.e. use a strong or medium. Merino over the Halfbred or crossbred, this will fine up the progeny while retaining body size and increasing wool weight. Only use the fine Merino ram once you have a Merino ewe to put it over. If you cross a fine ram over a Halfbred you will fine up faster but at the expense of wool weight. A fine ram over a Halfbred will produce fine wool but it will be light and fluffy, whereas if you come through stages of strong or medium Merino wool you will retain a heavier wool weight. Be wary of microns. I have been recording the micron measurements of stud hoggets for some years now and have found that generally late lambs will micron finer than the early lambs, twins will micron finer than singles and measurements taken at 10 months will be finer than if taken at 12 months.
Individual sheep microns should only be treated as a guide.

The micron measurement is not only influenced by breed. Do not expect microns to necessarily stay the same if you shift sheep to different areas. I have sold sheep to places which report lower micron measurements than our home flock and the opposite has also been the case. Feeding, climatic and management conditions play a major part in influencing micron measurement.

I once asked a down country farmer if sheep he bought in increased in micron. "No, no" he replied, "the footrot sees to that".

I've given my reasons for changing from Halfbreds to Merinos and some points I believe are worthy of consideration.

If in doubt always remember there are only two breeds in New Zealand, Merinos and others, so if you are considering changing, then there is really only one choice!

Changing to Merinos

D M Richardson*

"North Island Farmers Discovering Merinos". "Buyers compete for Merinos". "Merino Mania" These and similar headlines in the popular press have heralded a move into fine wool farming on a scale not seen since the establishment of Merinos in the North Island 150 years ago. The current move follows a serious decline in net farm incomes in 1985 which had a widespread impact on the decision making process of New Zealand farmers.

Diversification was a lifeboat to many people, particularly hill country sheep and beef farmers, and was evidenced by the proliferation of moves into deer, goats and horticulture. Attention was also focused on more profitable wool options such as carpet wool, high lustre breeds and high fleece weight strains of the Romney and Coopworth. At the end of the day, scientists and advisors agreed that a crossbred all-wool farming regime was generally uneconomic. Even at $6.00 to $7.00 return on a lamb it was better than what the best crossbred wool premium could offer by going all wool.

In the autumn of 1986 MAFTech held a meeting at Takapau to gauge the interest in fine wool as a viable North Island farming option. A handful of people showed interest and it was estimated that approximately thirty Merino flocks were established in the North Island, accounting for fewer than 10,000 ewes and 2,000 wethers. Media publicity that followed fuelled further

*MAFTech, Hastings

interest and it is now estimated that around 150 farmers are farming 432,000 purebred Merinos in the North Island. Several more breeders have established halfbred flocks with a view to grading up to a Merino purebred.

Is it an option

Many fundamental questions need to be answered before a decision can be made on economic grounds. A farmer's attitude and skills have to be laid bare. Changing to Merinos is a long-term policy - once you've made the change you're locked into it and many skills a farmer has learned with regard to crossbred management will no longer apply. He may have to be prepared to disregard meat production. He will have to draw a new picture of what a sheep production unit is.

During the crossbreeding boom of the late 1960s breed changes were sometimes made as an excuse for poor management. Many poor Coopworth and Perendale flocks resulted from poorly managed Romney flocks. Because Merino flock management is different in so many ways, farm management skills may eventually dictate the success of Merinos more so than geographical differences.

The farming recession has seriously affected farm fertiliser use to the extent that many North Island hill country farms are now four to five years without fertiliser. This has seen a reduction in pasture production and a reversion to less productive pasture species. Hill farmers producing light works lambs are now limited to adopting a store lamb policy. This, in turn, reduces income further and, as a result, inputs including fertiliser do not take place; and so the downward spiral continues. Such farmers are ideally situated for changing to Merinos.

The physical farm suitability is of some concern but from my experience there are very few, if any, North Island locations that are totally unsuitable for running Merinos (Figure 1).

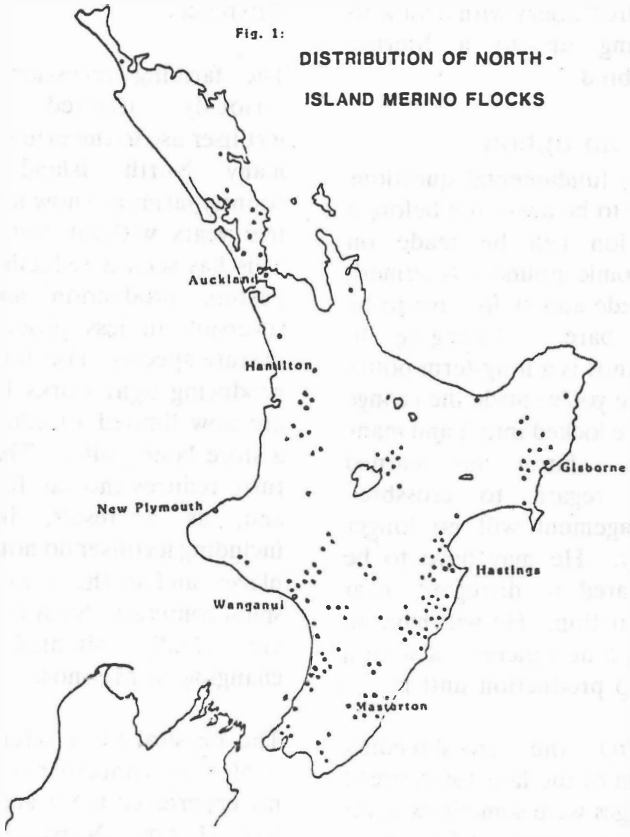


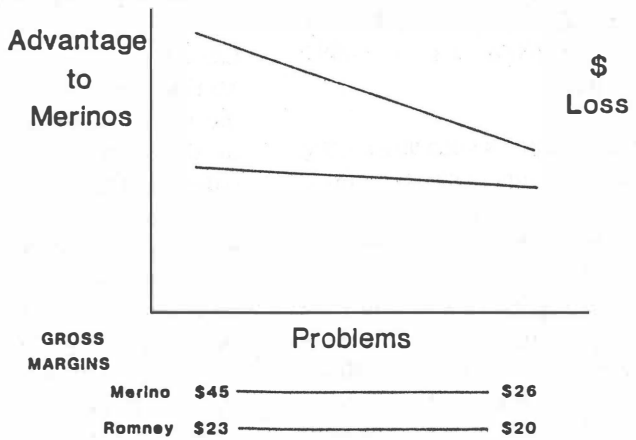
Fig. 1: DISTRIBUTION OF NORTH-ISLAND MERINO FLOCKS

The present North Island Merino population covers a wide range of environments; altitude, rainfall and soil type. Most favourable are yellow brown earths (800 - 1125 mm rainfall) and central pumice lands. Areas which are least favourable are those which provide a combination of high temperature, high humidity and wet underfoot conditions. This would include areas of Northland, the Waikato, eastern Bay of Plenty and parts of Taranaki and the King Country.

As problems increase, management costs increase and profitability declines. But alongside other options, Merinos still have a high gross margin, even under less than optimum growing conditions (Figure 2).

As with all farming options, the ultimate profitability of Merinos is reliant on making optimum use of available land, labour and capital. To this end there is plenty of scope for farmers in marginal areas to run Merinos as a sub-flock. Many North Island properties have a distinct range of soil types and/or aspects. Portions of the farm can be set aside

Fig. 2:



where fine wool production is the most appropriate option.

Merinos are being farmed as five per cent to 100 per cent of the sheep stock units on any given property.

Capital required to change to Merinos is the greatest limitation and usually dictates the stock numbers rather than whether or not a change if going to be made. Capital may also affect a farmer's attitude toward his sourcing of stock and can result in less suitable lines being purchased.

Capital, debt servicing, cash flow and net returns are all important and generally have the final say as to whether or not Merinos are a viable option.

Other aspects such as a saving in labour, easier farm management or complementing a shift in emphasis toward more cattle or deer play a significant part in making Merinos worthwhile. However, labour savings are only realistic where Merinos allow the shift to a dry flock to be economic.

Experience indicates that a Merino ewe flock generally has a higher labour requirement than the crossbred flock it replaces.

What is the system

Wet versus dry stock:

Considering the constraints of capital outlay, source of stock, management system and labour availability, ewe versus wether is an important decision. Wethers produce a comparable gross margin/SU to ewes under current stock values and wool prices but sensitivity changes may alter the relativity of the two options. A ewe flock can be established to generate a self-replacing wether flock.

Land Use:

Merinos may not suit all of the farm and a separate part of the farm may be set up solely for fine wool production. Clay loam flats may be unsuitable but argillite tops on the same property may be ideal. The area of suitability will dictate the proportion of Merinos in the total flock and what complementary stock, e.g. cattle, can be run with them.

Grazing System:
The markedly different grazing habit of Merinos lends itself to higher cattle to sheep ratios. Merinos tend to browse and will not chew a paddock out under the same pressure as crossbred sheep. For this reason it is unwise to run Merino sheep with crossbreds. They definitely prefer their own company and cannot compete with crossbreds in conditions more suited to crossbreds.

The grazing system is a sensitive issue for the sheep and we've found that a set stocked or shuffle system of grazing is better initially than an intensive rotation.

However, Merinos are also proving themselves to be more adaptable than we've given them credit for and success comes from easing them into any radical changes in management. For example, they don't respond well to coming off extensive South Island tussock lands and being thrown right up alongside an electric fence.

How do I get into it

There are two ways - buying purebreds or crossbreeding and grading up.

The high capital cost of buying purebreds has forced many farmers to take the crossbred route. But there are other reasons for crossbreeding as well. Typical of these are risk, quality of available stock, easing into new management skills and the possibility of the progeny being more environmentally suited. Until recently almost all of the Merinos in the North Island have been sourced from South Island sales. This applies to rams as well as ewes. It is expected that, for ewes at least, this trend will continue for some years yet as the North Island requirement far exceeds the supply from local sources. Rams are becoming more readily available as a handful of breeders have geared up for supply. But we are mindful that the quality of stock has to be maintained. MAFTech has taken a lead in this regard and is breeding from a fully recorded elite flock using a range of South Island genetic material. A

high culling level is maintained to produce a Merino which is highly adapted to North Island conditions. Selection criteria include fleece value and resistance to footrot and fleece rot.

Should North Island farmers purchase young or old stock
This question relates to the capital cost, transport and genetic merit. Either way a compromise has to be reached. Young stock may be more expensive but transport costs are lower. Older stock tend to be genetically superior but as they have a shorter life they have a longer pay-back period. Our experiences shows that the A.D. ewe is the preferred source of purebred Merinos entering the North Island.

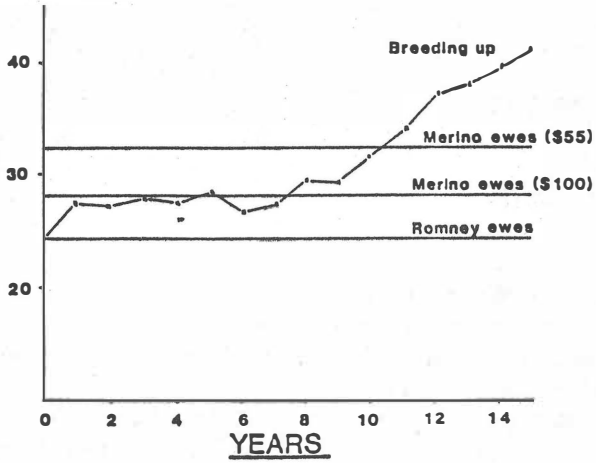
Crossbreeding is a serious alternative as it has a different capital requirement. The pay-back is not so dramatic but a buoyant market premium for half-bred wool over the last two seasons has encouraged farmers to follow this route. Good Merino rams are more readily available than ewes and they can be extended over many crossbred ewes.

Full returns from crossbreeding are not realised for 14 years but income increases almost immediately (Figure 3). If Merino purchase prices are high the margin is narrower.

What do I need to change and anticipate
There are two broad areas. Stock management and wool harvesting. For both areas the common ingredient is to change the thinking away from crossbreds. Merinos graze differently, yard differently, handle dogs differently, have different problems - in fact, are just plain different from crossbreds (Table 1).

Animal health problems are the greatest potential threat to success. Flystrike, fleece rot, footrot, lice and internal parasites can have a large impact on production. Of these, footrot and flystrike are the worst problems. Footrot control must be the first consideration. However, the incidence varies from nil on a very few properties to

Fig. 3: $/SU



chronic on others. Prevention is better than cure and a yearly shot of Footvax is very effective. Whilst a breeding programme is under way by buying rams bred to increase resistance to infection, farmers experiencing problems are advised to vaccinate.

Flystrike can be serious. It is not so easily seen on Merinos as it doesn't erupt through the wool and produce a dark colour as in crossbreds. You have to be more observant. The recently introducedgreenfly is of concern. Usual plunge or shower dripping is not as effective as with crossbreds and jetting is finding favour to get into a tighter fleece. Vetrazin is especially effective and gives up to three times the length of control than organo-phosphate materials. Whateverm ethod of dipping is used, North Island farmers are having to pay particular attention to achieving complete saturation.

Grazing habits are quite different with Merinos but most of this is attributed to the shift in environment of capital stock. Progeny coming

Table 1: Breed Comparison Trial - Takapau

2 year average	Merino	Romney
Post shearing fasted		
Lwt (kg)	36.5	56.4
G.F.W.	3.4	4.1
Fibre diameter	20.4	
n	61	32

Source: MAF

through are adapting to more intensive management. However, there is still a natural difference that has to be adjusted to.

Stock handling needs to be quieter. Merinos will take your yards apart if they are unduly pressured by dogs. They are best left unshepherded at lambing. Lamb desertion and mismothering is an easy trap to fall into for the unwary. Merinos cannot be pushed when travelling but are capable of running further than crossbreds. Merinos are more easily stressed than crossbreds and experience has shown that stock movement from the South Island early in the season (November/ December) results in a better lambing percentage than ewes shifted immediately pre-tupping or pre-lambing.

Merinos are cleaner than crossbreds but wrinkles are to be avoided. They not only make shearing and crutching more difficult but add to the susceptibility of body strike. Plain bodied Merinos are something to aim for.

The shearing date is an important fixture to get the best return for the wool. Although 90 per cent of the fleece value is related to fibre fineness, price sensitivity to contaminants increases with increased fineness. Peak soundness, colour and freedom from vegetable matter is achieved by shearing in late winter/early spring. The

current high premiums paid for superfine lines is such that many breeders are classing fleeces on individual micron test results. Repeatability is found to be good enough to warrant classing on the result of one initial adult pre-shear test. The need to shear only once a year may present problems with cash flow. Higher shearing costs will be incurred (Table 2).

The problem with shearing gangs unfamiliar with Merinos is quickly disappearing as they learn new techniques. However, it is in the farmer's interest to ensure that his shearers and woolhandlers are familiar with finewool before they enter the shed.

In Northland and on the east coast where dry summers are normal and pasture growth rate is often higher in winter than in summer, some thought is being given to autumn lambing. The later maturing nature of Merinos must be understood and it should be expected that they are not fully grown until four tooths. Two tooths are usually lambed in the North Island but expectations of a good percentage should not be a great as with crossbreds.

Fibre Supply

North Island breeders changing to Merinos are encouraged to discuss at length the many aspects of suitability, source, management and harvesting changes with others who have had experience before going ahead.

Having clear breeding objectives and keeping them realistic are stressed. One of the more obvious traps we've seen has been with superfine mania. Very high prices for wool under 19 microns have given unrealistic expectations to many farmers changing to Merinos and an unbalanced view of breeding objectives results. The relationship between fleece weight and fibre fineness must be understood. The Matakanui and Marlborough wether trials have been useful indicators of profitability in this regard (Table 3).

The North Island farmer changing to Merinos must

have a clear understanding of the market he is to supply. 70 per cent of world crossbred wool is traded by New Zealand. However, New Zealand produces less than one per cent of the world's wool under 24 microns.

Despite the small contribution that New Zealand makes to the finewool sector of the industry, the product is held in high regard by wool merchants and processors.

By world standards New Zealand wools are very sound and of even length. The colour of our wools is good and the generally low percentage of VM makes processing less expensive with less wear and tear on the fibre through the combing process. As a consequence top and noil ratios are high.

From a world finewool production point of view, an extra one million Merinos in the North Island would make little difference to the trade, and brokering agencies are already adapting quickly to the change. Earlier discounts applying to small lots are now not so evident as volume through Napier increases. Napier prices are more consistent with equivalent types at Christchurch than we saw two years ago.

However, any moves to introduce finewool sheep to the North Island must be made fully mindful of the reputation for an excellent product the South Island breeders have built up. It is important the "fly-by nighters" do not jeopardise this reputation.

During the 1988/89 season China was New Zealand's biggest wool customer purchasing an estimated 25 per cent of the national clip.

Almost all of this was crossbred wool and only a small quantity of half-bred and Corriedale was purchased. No Merino wool was purchased from New Zealand hat I am aware of and yet 60 per cent of China's wool imports is Merino wool. A significant reason for this lack of interest in New Zealand Merino is

Table 2

Shearing Award Rates ($/100)

	Merino and 1/4 bred	1/2 Bred, Corr. and Crossbred
Ewe Hoggets	$80.50	(
Wether Hgt	85.40	($73.50 all classes
Adult Ewes	93.45	(except lambs
Adult Wethers	98.00	(

Table 3

Estimated Average Fine Wool Returns and Fibre Diameter/Price Relationships based on Merino Wether Trial Data

Micron	Av. Clean fleece Weight (kg)	Av. Clean price 85/89 $	Av. Clean price 88/89 $	Return per head 85/89 $	Return per head 88/89 $
18	2.64	24	36	63	95
19	2.92	18	28	53	82
20	3.20	14	22	45	71
21	3.48	12	17	40	60
22	3.76	10	14	38	53
23	4.04	9	12	36	50
24	4.32	8	11	34	47

that Chinese orders come in 500 tonne parcels and we simply do not have the quantity at any one time to satisfy this requirement. Despite New Zealand producing a superior Merino wool type to Australia we generally receive a lower price. It is not unreasonable to expect this trend to reverse as the volume of New Zealand finewool and subsequent competition increases.

We have a clear responsibility to ensure that any change that is made in New Zealand finewool production is made with sufficient direction in breeding, management and clip preparation skills to enhance our place in the world finewool trade.

Acknowledgements
The author wishes to thank MAFTech staff for valuable comments, particularly A.P. Rhodes, D.F. Wright and G.J. Hamilton.

References

Joint New Zealand Wool Board and Meat and Wool Board's Economic Service Study 1988.

New Zealand Wool Report 4/198.

Proceedings of the Third Waipukurau Sheepfarmers' Conference, 24.

Agricultural Statistics 1983/84.

Wool 1989 Annual 59.

Seminar Proceedings - Merinos in Southern North Island, MAF.5.

The New Zealand Sheep and Beef Farm Survey, 1985/86.